This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

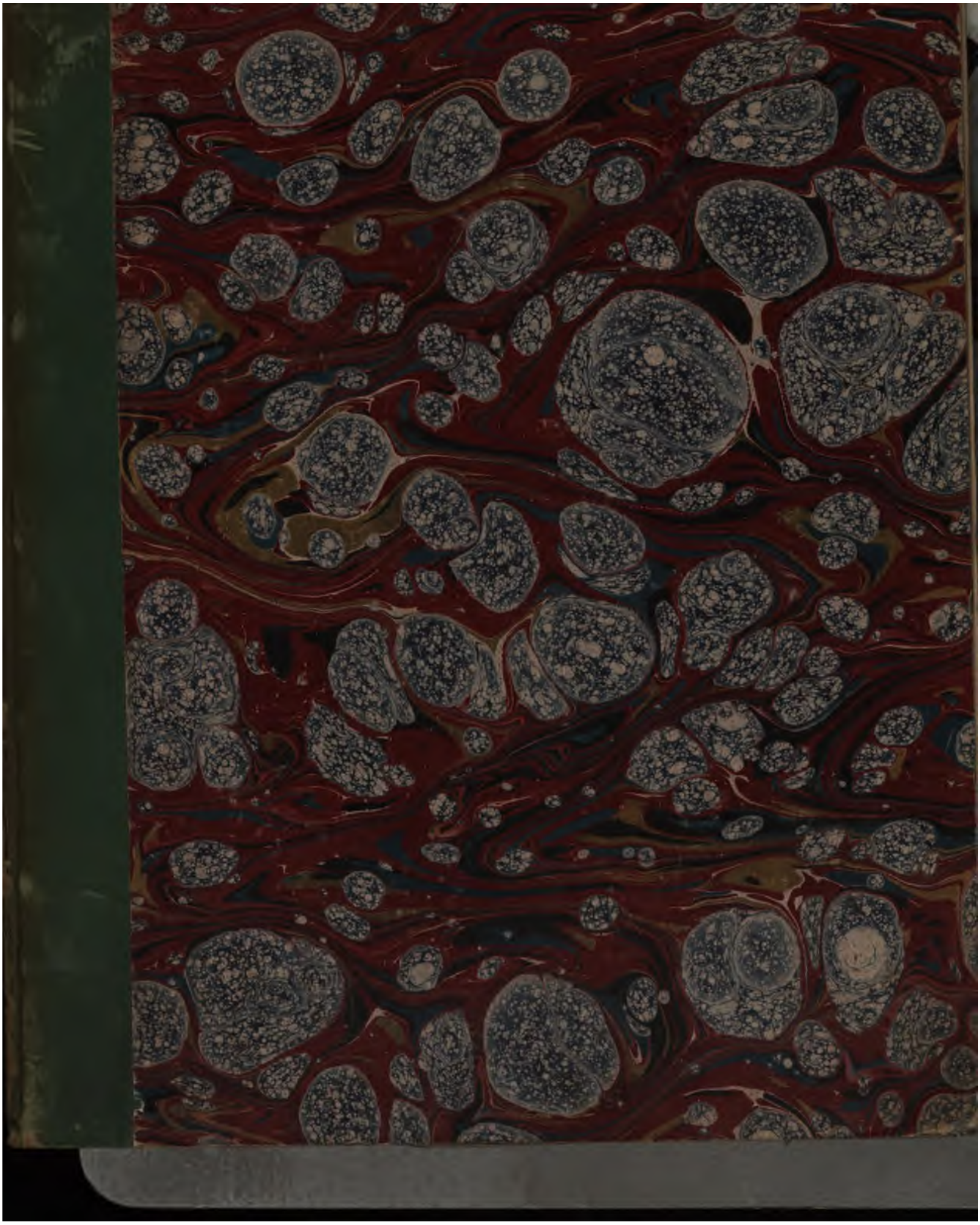
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



City of

MS, TREATMENT,
TLE PLAGUE.

GRAPHS.

ROTHERA · RODD

RGH: MACLACHLAN & STEWART,
Booksellers to the University.
ASGOW: THOMAS MURRAY & SON.
N: SIMPKIN, MARSHALL, & COMPANY.

MDCCCLXV.

189. f. 17.

REPORTS

TO THE

Lord Provost and Magistrates of the City of Edinburgh

ON THE

PATHOLOGICAL APPEARANCES, SYMPTOMS, TREATMENT, AND MEANS OF PREVENTING CATTLE PLAGUE.

WITH 23 COLOURED LITHOGRAPHS.

BIBLIOTHECA RADCLIVIANA

EDINBURGH: MACLACHLAN & STEWART,
Booksellers to the University.
GLASGOW: THOMAS MURRAY & SON.
LONDON: SIMPKIN, MARSHALL, & COMPANY.

MDCCCLXV.

189. h. 19.

EDINBURGH:
PRINTED BY JOHN GREIG AND SON.

REPORTS.

I.—INTERIM REPORT BY DR SMART

ON THE

PATHOLOGICAL APPEARANCES OF CATTLE PLAGUE AND OTHER EPIZOOTIC DISEASES AT PRESENT PREVAILING AMONG THE COWS IN EDINBURGH.

This *interim* Report is restricted to a description of the pathological condition of the animals inspected. The dissections were made at the Edinburgh Sanatorium and at Tyne Castle, and the appearances noted were seen by many persons who were present on these occasions. The parts described and illustrated by drawings and preparations, were selected only from examples of the pure and uncomplicated forms of the disease.

Description of Parts.

I. *Windpipe and Lungs.*—The entire mucous membrane lining the respiratory passages is reddened and highly vascular, presenting the appearance seen in the early stage of acute bronchial catarrh. (Pl. II. fig. 3.) It is sometimes nearly dry, but more frequently, especially in the smaller tubes, there is an abundance of frothy mucous, often of a slightly red or sanguineous tinge. The membrane is entirely free of the aphthous eruption which appears in the mouth; and very rarely are there any indications of an effusive or depositive inflammatory condition. The air-cells of the lungs, in uncomplicated cases, are healthy; and when an emphysematous condition of the organs exist, it is evidently chronic, and not, as represented, one of the morbid states superinduced by the disease.

II. *The Mouth, Pharynx, and Gullet.*—The appearance presented by the mouth is characteristic. The gums, lips, hard and soft palates, under-surface, and root of upper-surface of the tongue, the superior surface of the epiglottis and epiglottic folds of membrane, and the pharynx, are marked to a greater or less extent by an aphthous eruption. (Pl. III. fig. 2.) This condition has been termed "ulcerous," but we have repeatedly shewn that the subjacent membrane is entire. The roughened and granular aspect presented to the eye readily scrapes off, and consists of accumulated epithelium. (Pl. IV. fig. 1.) It collects on the surface of the membrane around the orifices of the follicles. This gives it a punctated or honeycomb appearance resembling

which they are so intimately connected. They are less prominent, and their outline is obscured by the discoloration of the superjacent membrane. They are *never ulcerated*, but a chronic, tuberculous condition of the solitary glands is of frequent occurrence. This is not uncommonly met with in healthy animals, and is not significant of any particular form of disease. The mesenteric glands shew no lesion of structure. They are bloodless and shrunken, and their lacteal vessels are generally empty.

VI. *Kidneys, Bladder, Uterus, &c.*—The pyramids of the kidneys are usually the congested portions, while the cortex is pale, but the structure is entire.

The condition of the lining membrane of the bladder and urethra are variable, but in no instance seriously involved. The uterus exhibits no peculiar feature, but the state of the vagina is characteristic. The vulva is swollen, its membrane tense, and has a very red and irritable aspect. (Pl. II. fig. 5.) An aphthous or epithelial eruption appears where the mucous surface joins the integument. (Pl. II. fig. 5.) A glairy, ropy mucous flows from the orifice, and hangs in strings from the vulva. (Pl. II. fig. 5.)

VII. *Heart, Liver, Spleen, Blood, &c.*—The muscular substance of the heart, like the muscular system generally, is relaxed and flabby. Its condition is not peculiar, but such as is ordinarily induced by many exhausting diseases. There is no valvular lesion or structural change, but ecchymosed patches on the exterior of the ventricles are sometimes met with. The large vessels, and their lining membranes, are healthy.

The liver is of natural size, pale in colour, but sound in structure. The gall-bladder is usually filled with bile, which is thin, and of a light green colour, and sometimes, but very rarely, patchy discolorations are found on its lining membrane.

The *spleen* is too pulpy, and breaks down under slight pressure. The pulp is composed of broken-down tissue and blood cells of a very dark colour. It is the splenic condition of exhausting fever.

The *urine*, in all the cases examined, contained albumen in varying proportions. There were present also blood cells in the majority of the cases referred to.

The *blood*, when retained in the vessels of a dead animal, remains fluid for a considerable period after death (Professor Lister). Forgetful of this fact, it has been assumed that the blood in this disease is "watery, and deficient in fibrine." In the instances which I have yet been able to examine, there was found excess of the fibrinous element, with deficiency of the proper salts of the blood. Should our further researches confirm this observation, additional light will thus be thrown on the pathology of the disease.

Sensible Qualities of the Blood.—It is unusually dark in colour, and coagulates slowly but firmly out of the body. The clot resembles pitch, and in the fluid state the blood has a somewhat tarry or porter-like appearance. (Plate IV. fig. 5, which compare with Pl. IV. fig. 4, shewing colour of healthy blood.) The temperature of freshly-drawn blood of a newly-slaughtered cow in the advanced stage of the disease was 91° Fahr. This coincides with the temperature of healthy blood examined under similar conditions; but the difference in their respective densities is remarkable. Thus:

Table of Temperature and Density.

Blood in Health.	Blood in Disease.
91° Fahr.	91° Fahr.
52° Sp. gravity.	59° Sp. gravity.

Microscopical Characters of the Blood.—1. The red corpuscles are small and shrunken. (Plate IV. fig. 3.) 2. The cell-walls of the corpuscles that are separated on the field shrink and corrugate, and many of them after a time assume to a remarkable degree the stellar configuration. (Pl. IV. fig. 3.) 3. They cohere tenaciously in confused masses, and their segregation under the microscope is extremely difficult. (Pl. IV. fig. 3.) 4. The white corpuscles are swelled out, many of them ruptured, and their granular contents dispersed over the microscopic field. (Pl. IV. fig. 3.) 5. The numerical proportion of the white corpuscles to the red is greatly in excess as compared with health. (Compare Pl. IV. fig. 2, shewing healthy ox blood, with Pl. IV. fig. 3, shewing diseased blood of Rinderpest cow in the last stage of the disease.) *

Microscopic appearance of the Milk.—(Pl. IV. fig. 7).—There is progressive diminution in the quantity of the milk, and the quality is greatly deteriorated. In the further stage, and during the acute progress of the disease, it is absent, or almost entirely so. It is then, when drawn from the cow, altogether creamy, and in some cases so rich-looking as to resemble melted butter. It possesses a peculiar persistent taste, owing probably in part to deficiency in sugar. It decomposes rapidly, and when microscopically examined, is seen to consist exclusively of fatty cells, crowded together, and overlaying one another. (Compare Pl. IV. fig. 6, shewing healthy milk, with Pl. IV. fig. 7, exhibiting the diseased condition.)

The serous membranes, when the disease is uncomplicated, are healthy, and without effusion into their sacs.

The cellular connective tissue of the loins, in some animals, is in a perfectly emphysematous condition. It is quite blown up, and distended with air, and the appearance presented is unusual and remarkable, but not singular. During life the general emphysema of the subcutaneous cellular tissue is by no means uncommon. It is a dangerous complication. One of my cows has just died from suffocation from this cause simply.

The Brain and Spinal Cord.—The cerebral membranes are much congested, but without vascular rupture or evtravasation. There is no cerebral effusion, and the brain itself is quite healthy. The membranes of the cord, in the cases examined, were not found congested. The spinal cord in every case was healthy.

The Udder.—Its structure is perfect and unimpaired. The diminished secretion must therefore be referred to systematic causes.

Appearances of Rinderpest Flesh.—The appearances presented by the flesh of animals which have died of Cattle Plague, or been slaughtered while labouring under the advanced disease, are peculiar and characteristic. It possesses a mulberry or dark

* The blood here microscopically delineated was taken as it flowed from the vessels of the dying animals and examined in the open air, The demonstrations were seen by many scientific persons, and the facts are accurately depicted in the drawings which accompany these Reports.

claret colour, with a remarkable quality of irredescence, or of changing colour. This is most strikingly seen on the newly cut end of a transverse section of fresh muscle (Pl. III. fig. 3). The colour of the fat is equally characteristic. It has a dark and dusky yellow, which becomes more marked after exposure to air and light for some time. Both muscle and fat exhibit an unusual degree of shrinking some hours after death (Pl. III. fig. 3, and Pl. III. fig. 4). The colour of freshly killed beef, both diseased and healthy, after a period of exposure, always undergoes considerable change; but in Rinderpest flesh this change is peculiarly marked. It soon loses its most striking features of contrast to healthy muscle, and the mulberry hue is insensibly exchanged for the reddened tint of more healthy meat (Pl. III. fig. 4, and Pl. III. fig. 5). There is still left, however, a distinctive difference, which it is difficult to express in language, but which readily strikes the experienced eye. (Compare Pl. III. fig. 4, shewing Rinderpest flesh twenty-four hours after exposure to light, with Pl. III. fig. 5, exhibiting section of healthy ox steak after a similar period of exposure.) The former delineation shews an element of brown in the colour, which tones down, and imparts a significant and peculiar duskiness to it. The fat also participates in this peculiarity. These obvious and sensible distinctions have already assumed much practical importance; and our Inspectors of Markets are now daily guided by them in their difficult decisions as to sound and marketable, and diseased and unwholesome, meat.

Summary.

The number of cases examined and reported upon are yet insufficient as a basis of general inference, and the following conclusions are not intended to go beyond our present information.—

1. It is the mucous membranes that manifest the diseased condition principally.
2. They do not all exhibit precisely similar morbid states, nor suffer to the same extent.
3. In some of the membranes the pathological condition is constant and characteristic; in others it is variable.
4. Many of the pathological appearances present in the diseased organs are not peculiar to this malady, and are not distinctive. Thus (*e.g.*) the state of the bowel in the muco-enteritis of cattle closely resembles that presented in this disease.
5. The condition of the bladder and uterus is such as occurs in all congested states of these organs.
6. The heart, liver, and spleen may be regarded as functionally healthy. They are in the condition which results from exhausting disease of any kind; while the lining membrane of the air passages exhibits the morbid change which occurs in acute bronchial catarrh. The kidneys are invariably congested.
7. The remarkable rings or patches found on the folds of the third stomach were found present in only a proportion of all the cases examined, and are not consequently distinctive.
8. The condition of the membrane of the fourth stomach is invariable. It likewise manifests the morbid changes in their most advanced and destructive forms. It is therefore the most characteristic pathological lesion. The swollen, congested, and

aphthous vulva, and aphthous mouth, have also been found invariably present. When these morbid conditions concur with that of the bowel in the same animal, the group is complete and decisive.

9. As regards negative conditions, there is no *ulceration*, and very rarely any trace of inflammatory products.

10. The reddened colour of the membranes is due to congestion in its extreme form, and not to ecchymosis or extravasation.

11. Emphysema of the lung is not, as has been stated, a concomitant of the disease.

12. Present information would appear to indicate that the blood, instead of being "watery and deficient in fibrine," is in an opposite condition—viz., that the water is deficient, and the fibrine increased, and salts diminished.

13. We must not omit to mention an invariable and characteristic feature of the disease—namely, *the smell of the diseased parts*, and especially of the abdominal viscera. The odour once experienced cannot afterwards be mistaken. It is peculiar and distinctive.

14. As to complication, a proportion of two-thirds of all the animals examined were affected with pleuro-pneumonia

15. In conclusion, as regards analogous morbid conditions in the human subject, we have already remarked the broad differential distinction in the character of the morbid lesions in this disease, and in the ulcerative typhoid of man. As regards human typhus, the analogy likewise fails. The disease is undoubtedly peculiar, and *sui generis*. If the desire to classify and generalise is to be so far satisfied, and analogous conditions found in human pathology,—the symptoms of the disease and its periodicity,—the general congestive but non-inflammatory vascularity of the mucous membranes, especially of the alimentary tract,—the tendency to epithelial disquamation from the general mucous surface,—all point to a condition of these membranes mostly resembling that of the integument in acute scarlatina, and the disease might not inaptly be termed internal or mucous scarlatina. The congested condition of the kidneys, in all cases, and the invariable presence of albumen and blood-cells in the urine, tend to support and confirm this view.

ANDREW SMART, M.D.

Edinburgh, 28 *Alva Street, September* 12. 1865.

SUPPLEMENTARY NOTE.

Since the substance of the preceding Report was written, I have greatly extended the basis of inquiry, and have completed dissections of one hundred animals which either died or were slaughtered while labouring under Rinderpest, or some other present prevailing epizootic disease.

I hope soon to be able, in a subsequent Report, to present in tabulated form the results of these investigations, which, with some modifications, tend to confirm my previous observations. In the mean time, I may indicate in a general manner one or two points in the report requiring qualification, and some others of interest not contained in it.

Firstly, Pleuro-pneumonia (chronic) is the most frequent and dangerous complication of the disease, but the numerical proportion of this form of complication has become smaller

with the increasing number of dissections. The proportion is now somewhat less than two-thirds, as formerly stated.

Secondly, Many of the animals dissected were cases of pleuro-pneumonia, without Rinderpest or any other complication.

Thirdly, Of the hundred dissections, there were sixteen in cattle affected with murrain disease alone, without other complication.

The dissections in the cases of pleuro-pneumonia and murrain (or mouth and foot rot), were made with a view to ascertain their characteristic and distinctive pathological appearances, as compared with those found in cattle plague.

The following are the general indications of the conclusions reached: 1. In simple and uncomplicated pleuro-pneumonia (chronic or acute), the characteristic condition of the mucous membranes found in Rinderpest has not been met with. 2. In cases of uncomplicated murrain disease (mouth and foot rot), there exists a degree of reddening of the lining membrane of the fourth stomach, somewhat resembling the appearance presented in the same stomach of animals affected with Rinderpest (Pl. I. fig. 4.) But there are the following very marked distinctions: (1.) In murrain, the congestive reddening is limited to the upper third of the membrane; (2.) The colour of the membrane, as compared with that in Rinderpest, is deficient in depth, and never exhibits the claret or purple tinge; (3.) The epithelium is entire, and the mucous membrane sound; (4.) In all the cases of murrain examined, the reddened colour of the membrane referred to, was associated with dark coloured spots varying in size and configuration (Pl. I. fig. 4). These dark patches are submucous hemorrhages or apoplexies. The blood thus deposited acts as a foreign body, and ultimately leads to the erosion of the superjacent membrane. With the exception of the partial reddening of the lining membrane of the fourth stomach, the pathological appearances in murrain disease bear no other resemblance to those found in Rinderpest. In examples of uncomplicated pleuro-pneumonia, the characteristic appearances of both Rinderpest and murrain are quite absent.*

* Dr Arthur Gamgee of Edinburgh, who has been carrying on an independent series of examinations of the blood and urine in this disease, has kindly placed the following results of his original observations at my disposal. While Dr Gamgee's inquiries into the condition of the blood and urine are more complete than my own, it will be seen, by their comparison, that they strikingly tend to confirm and establish my previous views:—

Results of Analysis of Blood.

1. The water of the blood is diminished. 2. Solids of serum diminished. 3. Blood corpuscles increased. 4. Fibrine increased. 5. Proper salts (so far as yet determined) diminished. Examples:

The blood of a healthy calf contained 4.53 parts of fibrine in 1000 parts, and 89.69 parts of corpuscles in 1000 parts.

The blood of the same animal after the disease was induced by inoculation.

The fibrine rose to 4.85 parts per 1000, and the blood corpuscles to 117.7 per 1000. The induced disease in this case was *slight*.

The fibrine in a bad case, just before the animal's death, amounted to 9.9 per 1000 parts.

Results of Analysis of Urine.

In three cases examined, the colouring matter of bile was present. In one, the bile acids were present; and in one case examined for leucine and tyrosine, these constituents were not found.

In a considerable number of cases the urea, by per-centage analysis, was not diminished, and varied from 1.75 per cent. to 2.3 per cent. The urea of the collected urine of twenty-four hours was not determined.

II.—SECOND INTERIM REPORT BY DR SMART

ON THE

SYMPTOMS AND TREATMENT OF CATTLE PLAGUE.

In compliance with my instructions from the Magistrates, I now submit an interim report on the symptoms and treatment of cows affected with cattle plague. The Magistrates, who were desirous that a rational system of treatment should be based upon my exposition of the pathological conditions of the disease, suggested this experimental inquiry, and it was undertaken at their request. Having secured a suitable byre in town, and the services of experienced assistants, I admitted the first cow for treatment on the 21st of September. Since that period, thirteen in different stages of the disease have been under treatment. Of that number two have died. Of the two deaths the disease in one was complicated with double pleuro-pneumonia, which precluded recovery; and the other was admitted in the advanced stage of the disease, and died a few hours thereafter. Of the remaining eleven there are five recoveries, and it is premature to express any opinion of the rest, as they have not yet been under treatment for a sufficiently lengthened period.

I. Symptoms of the Disease.

1. *Period of Incubation.*—This is the latent period of the disease, beginning with the reception of the poison by the animal, and terminating when the symptoms of its development in the system become apparent. The duration of this period has been variously stated, but all my observations lead me to conclude that it terminates on the seventh day, by the outward manifestation of distinctly recognisable indications. These are,

2. *The Earliest Recognisable Symptoms.*—They are enumerated as nearly as possible in the order in which they appear. 1. Loss of appetite. This shews itself (1) by an aversion to all sorts of "green food." The next day or the following there is (2) indifference to food of any kind. The animal still eats, but languidly, does not lick out the pail, or leaves a portion of the meal, and soon thereafter refuses food altogether. It now ceases to chew the cud, and from this time there is commencing constipation, with progressive diminution of the milk. The animal looks depressed, stands much in the same posture, with drooping head and reclining ears. The ears, horns, and other extremities are now sensibly under their natural temperature. The breathing is yet but slightly accelerated, and the expiration (or outbreath) perceptibly prolonged, and the pulse rises a few beats in frequency. It is at this period the orifice of the vagina reddens, and the colour deepens as the disease advances. This appearance of the vulva is the most characteristic and reliable mark of the disease at this stage. A faint-red or purple line about the same time appears on the under gum along the roots of the teeth. All these symptoms concur within a day or two of the incubation period. The diseased condition of the internal organs after death clearly

points to this and the preceding period of the disease as the proper time for successful treatment, before destructive changes have too far advanced.

3. *More Advanced Symptoms.*—The breathing is now more accelerated, oppressed, sighing, and laborious. The number of respirations vary generally from 36 to 70 per minute. The pulse is more rapid (from 60 to 110 pulsations per minute) and weaker. There is continued loss of appetite, constipation, and thirst. The superficial membrane of the mouth, especially of the inner side of the under lip, roughens, and a viscid discharge appears in the vagina. A similar eruptive or roughened appearance is seen on the membrane of the vagina where it joins the skin. The milk is scanty, and entirely changed to cream, or there is none at all. All the other symptoms are more decidedly pronounced. The likelihood of recovery is greatly diminished by delaying treatment to this period.

4. *Most Advanced Symptoms.*—They are those which shortly precede death, and are unattended by any very marked outward signs of pain. The breathing is now slow, very laborious, and moaning or grunting. Pulse slow and small. Where purgatives have not been given, there is great distension of the abdomen, and obstinate constipation. The fluid and sometimes sanguineous discharges from the bowels, which occur in some cases, are the results generally of the too frequent use of irritant drugs. The superficial membrane of the mouth peels off from the gums and lips, leaving the surface raw; and frequently, but not invariably, there is a viscid discharge from the eyes, nostrils, and vagina. The animal now dies without a struggle, apparently from simple exhaustion.

The "staring hide" and "arched-back," so frequently mentioned as distinctive features of this disease, while characteristic of the advanced forms of pleuro-pneumonia, are not at all marks of the *Rinderpest.* There is no cough or lung symptom in the pure and uncomplicated examples of the disease.

II. General Principles of Treatment.

These are based upon a knowledge of the pathology of the disease, and indicate the line of treatment to be adopted in dealing with it.

1. *The Animal Temperature is Lowered and Deficient.*—This has to be restored and maintained. To do so the affected animal is protected from all direct draughts of air, placed in a house or byre with an equable temperature not under 70 deg. Fah., and the hide thoroughly cleaned and rubbed down, and a warm covering kept on the animal throughout the progress of the case.

2. *The Stomachs are Loaded and Distended with Food.*—This condition, by preventing access of medicine and suitable nourishment, presents a very great obstacle to treatment. But it also indicates the line of treatment to be adopted at this stage —namely, to remove the hurtful accumulation as quickly as possible. This must be done by mild purgation, suited to the already irritable condition of the lining membrane of the stomach and bowels. The medicines here indicated are gentle relaxants combined with diuretic action.

3. *Extreme Vital Depression is Characteristic of the Disease throughout its entire Progress.*—This is conjoined with a very peculiar and rapidly destructive change of some of the internal structures. Stimulants to support the depressed vital

powers, and resist, as far as possible, this tendency to destructive dissolution, are thus clearly indicated from the very commencement. And as it is of importance to make the healthy organs subserve the purpose of removing from the blood the morbid materials that may exist in it and in the general system, stimulant treatment should conjoin with it remedies fitted to excite the functional activity of the two great eliminators of this class—namely, the skin and kidneys. Hence stimulant, diaphoretic and diuretic action are here indicated. Regular milking of the diseased cow, in order to prevent the retention in the blood of the elements of the milk, is also, on the same general principles, clearly indicated throughout the entire course of the disease.

4. It almost appears an axiom to say that a properly regulated and rational system of nursing is in the treatment of disease in cattle, as in man, of very great importance to the comfort of the sick, and as an aid to their recovery. In the present example, no method of combating the malady can be of any use in which careful nursing does not form the basis of every other effort to restore health. It is not idle to repeat this, because in any system of treatment hitherto made public, the importance of this fact has either been insufficiently recognised or entirely overlooked. Hence arises the necessity of there being kind, skilful, and experienced attendants, and a well-regulated dietary.

III. Remedies.

These are few, simple, and selected on the principles above stated. My experience of their suitableness is every day more established by fresh examples of their efficacy. There are yet only three kinds of drugs which I found it requisite to employ. 1. Laxative, with diuretic action. This is principally used in the early, but often required at other periods, in the progress of the disease. It is composed of

Laxative.

Nitrate of potash } of each one ounce.
Powdered ginger }
Powder of sublimed sulphur, 2 ounces.
Treacle, 1 lb.
Water to make a quart, and well mixed.

This quantity is given night and morning, or, if requisite, oftener, until scouring is produced. Afterwards, an occasional bottle will maintain the free movement of the bowels without inducing excessive action. In cases where constipation is very obstinate, eight ounces of epsom salts may be added to this mixture with advantage.

As the vital powers sink rapidly, there should be as little delay as possible in administering stimulants. I have found the following mixture possessing stimulant, diuretic, and diaphoretic properties very efficacious:—

Stimulant.

Carbonate of ammonia, ¾ of an ounce.
Sweet spirit of nitre, } of each, 1 ounce and a-half.
Spirit of mindereris,* }
Cold water, 9 ounces. Mix.

* The quantity of mindereris spirit here is that which is made according to the formula of the old pharmacopœa.

This dose, from the commencement of treatment, may be administered thrice a-day during the entire course of the disease. It is not unfrequently necessary, especially in cases where there is persistent constipation, to combine the relaxant with the stimulant mixture. In such instances, the doses of the stimulant may be reduced one third.

When convalescence is fully established, a simple tonic hastens recovery. I find none so good and safe as cinchona bark. The best quality only should be used, and given in doses of one ounce and a-half of the powder.

This tonic in the early period of convalescence is combined with the stimulant, and at a later period with a quart of good sweet ale, given once daily. It is best administered at night. Two tablespoonfuls of laudanum may be added at any time to any other medicine which the animal is getting, or given in the food when it becomes requisite to control excessive diarrhœa, or obviate straining.

IV.—Diet.

It should be simple, and, until decided convalescence, well cooked, and given in small and regulated quantity.

I use the following;—1. Full mash. It is composed of:—

Four handfuls of bran.
Four handfuls of brewer's draff.
1 lb. of peasemeal.
2 lb. of mashed turnips, well boiled.

Not too thick, and given night and morning. At mid-day a drink of gruel is given, made with 2 lbs. of oatmeal, well boiled in six quarts of water. In addition to these, some raw turnip (2 lbs., for example, of greentops), and 1 lb. of hay, may be allowed in small quantities during the twenty-four hours. To allay thirst, three to four quarts of water, previously boiled and allowed to cool, is given in mouthfuls during the day.* This constitutes the full diet of a decided convalescent. Half of this diet is, in most instances, during the acute course of the disease, too much. In all cases the same kind of food and periods of giving it are followed. There are some animals that for a time refuse all food, not excepting gruel. In such cases the gruel is administered by the bottle thrice daily, along with or after the medicine. The animal should get a little mash so soon as it takes it voluntarily. It is often expedient to miss a meal, especially whenever symptoms of an unfavourable indication appear. These are not of unfrequent occurrence during the course of treatment. Grass is given, and the quantity of hay and turnip increased as there is progress towards more perfect recovery.

V.—Symptoms of Convalesence.

The more obvious indications are,—1. Recovery of appetite; 2. Greater animation; 3. Return of breathing and pulse to their normal condition; 4. Increase of milk;

* Many of the diseased animals evince a remarkable predilection for charred wood; and as carbon is an excellent antiseptic, it is only obeying a natural indication to supply materials to satisfy this craving. To do so, charred wood may be boiled with the water, and a few small charred branches of trees placed in the stall.

5. Chewing the cud. The seventh, fourteenth, and twenty-first days are critical periods in the progress of the disease.

VI.—Summary of Treatment.

1. The animal is at once taken from its ordinary food and separated from the rest. 2. Placed in a well-aired byre or house free from draughts, and the temperature of which is maintained at 70° F. or 75° F. 3. It is to be well rubbed down, and thoroughly cleaned and covered with a good rug. 4. If there be constipation, begin with laxative and continue night and morning, or, if required, oftener until there is free scouring. 5. Let there be no delay in giving the stimulant, and, if needful, combine it with the laxative. 6. Defer giving ale and bark until convalescence appears. 7. To obviate straining or excessive purging, two tablespoonfuls of laudanum night and morning may be added to other medicine. 8. Be careful to avoid overfeeding, as an error in diet may prove fatal. 9. See that the cow is well milked night and morning (even when there is no yield), during the course of the disease. 10. All the droppings should be at once disinfected by solution of chloride of lime, and quickly removed. 11. The affected animals should be frequently and closely observed, and threatening indications treated as they occur.

To many it will be more interesting, and perhaps more instructive than a general statement of principles, to peruse the daily records of a number of cases successfully treated by me at the experimental byre. The cases selected were recognised by all the members of the medical committee as undoubted cases of *Rinderpest*, and their treatment and progress observed and noted from day to day. The following notes are from my daily Journal of the cases :—

Examples of Cases Successfully Treated.

First Case.—A cow from an infected byre in the Canongate, admitted on the 21st September. This cow, when I saw her, was very weak, and I expected her to die the same night. The breathing was laboured and sighing, and the animal was cold all over. Had taken no food for five days before it was brought to the experimental byre, and the milk and cudding had been quite absent during that period. The animal was not put under treatment until next day, when it was thoroughly rubbed down and covered with double rugs. As there was already scouring, it was ordered stimulants three times a day, and to be fed entirely on gruel. It got worse apparently for two days; scouring became excessive, and mixed with blood. But on the 25th the cow was so well as to be allowed a little mash. The temperature was good, scouring less, and there was abundance of healthy urine. During the following two days there was no apparent progress. The breathing was very oppressed. Pulse, 100 per minute, had not strength to rise, and the animal was breathless and exhausted after any effort. On the 28th it was decidedly better; was warmer, more animated, and looked eagerly for the gruel, some of which it partook of voluntarily for the first time. The urine was abundant, and the dung more natural. Now getting a bottle of ale and stimulant mixture twice daily. On the 29th, the cow was allowed to eat too freely of hay, and relapse of twenty-four hours followed. This relapse was

accompanied by much diarrhœa and straining, which had to be corrected by a tablespoonful of laudanum night and morning. During the next few days some progress towards recovery was made. Had stimulant twice and sometimes thrice a-day, and in the evening ale with tonic powder. On the 4th October the pulse was 72, and getting stronger, and the respirations were 36 per minute. At this time the food consisted chiefly of gruel. Convalescence now appeared, and became decided. The cow was more lively—no scouring. Temperature was good, but the hide over the back and on both sides of the neck was puffed up with air under it (general emphysema of the cellular tissue), and when struck emitted a drummy sound. The following day the most unequivocal sign of advanced convalescence was evinced—viz., cudding. Two small mashes with a little turnip and grass, the stimulant mixture twice, and at evening the bark in warm ale and gruel, now constituted the daily food and medicine of the animal. Milk returning. From this period there was rapid and favourable progress. The pulse and breathing were now natural, and the cow had otherwise quite recovered. It will be returned to the owner in excellent condition in a day or two. The puffiness of the skin is every day getting less. I have not seen a more hopeless case than this for treatment, and the recovery of this patient is full of encouragement.

Second Case.—A cow from an infected byre. Put under treatment on the 28th September. She had taken no food, nor had been seen cudding for two days previously. Pulse, 96. Constipation, and loaded paunch. The vagina shewed the characteristic colour. To remove the existing constipation the cow was at once treated with the laxative mixture night and morning. On the 1st October the journal notes that the pulse is 96, weak, and respiration 72 per minute and oppressed. Free scouring, which lasts all next day, and is moderated by a tablespoonful of laudanum night and morning, along with the stimulant. Next day, probably the seventh, signs of convalescence appear; the animal takes a little mash night and morning, but lives mostly on gruel; scouring abated. October 4.—Convalescence is more marked; pulse, breathing, and temperature becoming more natural, and indications of returning milk. October 7.—All the signs of returning health are now present; takes small mash night and morning, with a little turnip, hay, and grass. The milk is returning rapidly; breathing tranquil. The treatment throughout of this case has been that mentioned above—viz., laxative, stimulant, and tonic in the order mentioned. The cow was returned to her owners in excellent condition some days ago.

Third Case.—Cow from an infected byre. Admitted on the 29th September. When I saw her all the marks of the disease were present. Pulse 100, and weak; breathing oppressed; no appetite; very depressed and thirsty; reddened vagina and gums—constipation. Had laxative mixture, and was freely scoured by a single bottle of it. To have stimulant mixture three times a-day. The animal remains in an undecided state during the next three days, refusing food, except gruel, and a little thin mash. October 3.—The pulse is 60, and respiration 48 a minute. The cow is more lively, eats a little better. Same treatment continued as above, and to have a tonic powder and ale at night. October 6.—The pulse is still high—viz., 80; the respiratories are 48, and the breathing is oppressed; otherwise, her condition is not markedly

changed. October 9.—Signs of convalescence are now quite decided. Appetite quite restored, and the animal takes the full meal of a decided convalescent greedily. The milk is much increased in quantity, and is improving in quality, but the pulse and breathing are still a little too high. This arises from a slight attack of pleurisy, which the cow has caught since admission to the byre.

Fourth Case.—From an infected byre. A fine Ayrshire cow, admitted 26th September. Had taken no food for two days before admission. The animal was dull, losing milk, oppressed in breathing, and the pulse was 100. The other signs of the disease were present—viz., reddened vagina and gums. As there was constipation, laxative mixture was given, and there was free scouring next day. Stimulant treatment was next adopted, and the diet consisted of small mashes twice a-day, with gruel at mid-day. On the 1st October the pulse was 96, respirations 48 per minute, temperature natural, but the animal was dull, and had no appetite. On the following day, signs of improvement appeared and continued. The treatment now consisted of stimulant twice a-day, and ale and bark at night. On the 9th the journal states that the patient is decidedly convalescent; milk greatly increased in quantity, and improving in quality. Gets full diet, and takes it eagerly. This cow will be sent home in a day or two.

Fifth Case.—Cow from an infected byre, where ten had previously died of the disease. Admitted 1st October. Had all the distinctive marks of the disease already enumerated, and was treated on similar principles. For three days the pulse was 95, and the respiration attained the extraordinary number of 102 a minute. There is nothing specially to be noted in the details of the treatment in this case. The cow is now, after seven days' illness, quite convalescent, giving full milk, chewing cud, and taking full diet. It will be sent home in the course of a day or two.

ANDREW SMART, M.D.

28 *Alva Street, October* 9. 1865.

III.—THIRD INTERIM REPORT BY DR SMART

ON THE

MEANS OF PREVENTING CATTLE PLAGUE, &c.

There have been in all fifteen cows admitted to the Experimental Byre, and of these, thirteen only were placed under treatment. Of the thirteen, there have been five recoveries, seven deaths, and one is still under treatment. The following is the analysis of the deaths:—In three cases, all from the same byre, the plague was complicated with murrain. Another had the fatal complication of double pleuro-pneumonia, and the remaining three were pure cases of the disease, without any other complication. The entire seven, without exception, were in the second or advanced stage of the disease when admitted to the byre, and were consequently all unfavourable subjects for treatment. Of the recoveries, three have been restored to their owners, and are doing well, and two are still detained as convalescents. The sixth has emerged from the disease, and is now struggling with the subsequent exhaustion.

From these facts one or two considerations arise, which I am desirous to bring under the attention of the Magistrates.

In the first place, my experience convinces me of the impossibility of reaching the diseased animals in time for amenable treatment, that is, in the early stage of it, from the reluctance of owners to acknowledge the existence of disease in their stock. For example, only two of the cases under my treatment were seen in the early period of the disease, and both cases were convalescent on the seventh day.

Secondly, these motives for concealment on the part of the owners of diseased stock are not at all likely to be overcome, and hence arises the importance of recommending for general adoption, measures intended more to *prevent* the spread of the disease, than to encounter the extreme risks and difficulties of its treatment. Having been lately consulted by large owners of cattle in different parts of the country, among whose stock an outbreak is threatened, or has already occurred, I am much impressed with the immediate necessity of adopting such a course. From my experience of their views, I do not hesitate to think, that any preventive suggestion would be at once eagerly and generally given effect to over the country.

As to *Preventive Remedies*, I am, from all I know of the disease, disposed to give preference to the salts of soda and magnesia in the form of sulphites. Dr Polli, of Milan, has proved by careful experiments, that the compounds of sulphurous acid with alkalies and alkaline earths, possess in an eminent degree the property of arresting *decomposition* and *fermentation* in both living and dead animal tissues.* On the assumption, that in "Rinderpest" there exists a blood poison, acting either by fermentation or decomposition, it may be fairly inferred that the abundant introduction of these salts into the blood of the living animal, will prove the means of warding off the accession of the disease altogether. The salts of soda and magnesia are further recommended, by the fact of their forming natural constituents of the blood in health, and also by the ease with which they can be administered, and their perfect freedom from danger, or, I should rather say, extreme medicinal wholesomeness when given in large and continued doses.

Should these considerations, as regards Prevention, weigh with the Magistrates, the following simple rule as to dose and mode of administering the medicine, would place it within the power of all interested persons to give effect to their recommendation:—

Every full-grown animal should receive two ounces of this preparation daily, and to younger animals doses of one ounce and a-half should be given. When this course of treatment has been followed for a period of six successive days, an interval of twenty-four hours may be allowed to elapse, when the treatment is to be resumed as formerly. After a fortnight's treatment conducted in this manner, the exhibition of the medicine should be suspended every third day during an interval of twenty-four hours.

The sulphite of soda is readily soluble in water and can be easily administered in the mash or drink of the animal.

Note.—It is the *sulphite*, not sulphate, which should be used.

ANDREW SMART, M.D.

28 ALVA STREET, EDINBURGH,
October 18. 1865.

* Though fully conversant with Dr Polli's experiments, I have to acknowledge that I was reminded of the probable value of these salts as a prophylactic in this disease, by an article in the *Medical Times and Gazette* of last Saturday.

IV.—FOURTH REPORT BY DR SMART

ON THE

PATHOLOGICAL APPEARANCES OF CATTLE PLAGUE AND OTHER EPIZOOTIC DISEASES AT PRESENT PREVAILING AMONG THE COWS IN EDINBURGH.

In a former Report on the pathological appearances of cattle plague, and other epizootic diseases at present prevailing in Edinburgh, I stated that I should still continue my inquiries on that subject, and that I would on a future occasion present the results of more extended observations. I have completed dissections of upwards of a hundred diseased cattle, and recorded the facts of each case in tabular forms, which will be found at page 23. The following summary of pathological appearances is deduced from them.

Summary of Pathological Appearances.

The number of cases formerly examined and reported upon were insufficient as a basis of general inference, but the following conclusions rest upon a much wider foundation, and are deduced from upwards of One hundred dissections of animals which died of Cattle Plague and other epizootic diseases.

1. The disease is one which principally attacks the mucous membranes, that is, the membranes lining the internal cavities of the body, but these do not all exhibit similar morbid conditions, nor suffer to the same extent in the morbid changes induced.

Pathological Appearances Invariable but not Characteristic.—These are, *first*, the state of the bowel. This resembles the condition found existing in the ordinary muco-enteritis of cattle.

2. The condition of the lining membranes of the bladder and uterus is such as occurs in all congested states of these organs.

3. The central portions (pyramids) of the kidneys present the congestive condition, found in the early inflammatory stage of these organs.

4. The heart, liver, and spleen, may be regarded as functionally healthy. They are in the condition which results from exhausting disease of any kind, and the lining membranes of the air passages exhibit the morbid changes which are present in acute bronchial catarrh.

5. The remarkable and unique gangrenous rings or patches found on the folds of the third stomach, exist in only a proportion of all the cases examined; they are therefore neither invariable nor characteristic marks of the disease.

Pathological Appearances which are Invariable and Characteristic.—These are First, The peculiar appearance and diseased condition of the lining membrane of the fourth stomach. It likewise manifests all the morbid changes so distinctive of this disease, in their most advanced and destructive forms. It is therefore the most

characteristic pathological lesion. Secondly, The reddened and congested condition of the vulva. Thirdly, The eruption or roughening on some parts of the superficial membrane of the mouth. When these diseased appearances are found co-existing with the condition of the bowel already described, the pathological group is complete and unequivocal. As regards negative conditions, there exists no true ulceration anywhere, and rarely any trace of inflammatory products are found. The reddened colour of the diseased membranes is due to vascular congestion in its extreme form, and not, as frequently alleged, to ecchymoses or extravasations. Emphysema of the lung is not, as has been stated, a concomitant condition of the disease.

Condition of the Blood.—The blood, instead of being "watery and deficient in fibrine," as at first asserted, is in an opposite condition, viz. the water is deficient, the fibrine increased, and the salts diminished.

The Character of the Disease, as deduced from the morbid appearances which it presents, bears no resemblance to the ulcerative typhoid fever of man. As regards human typhus, the analogy likewise fails. The morbid conditions are undoubtedly peculiar. In so far as any resemblance to human disease exists, it points to a condition of the internal lining membranes analogous to that of the skin in acute Scarlatina, and the disease might not inaptly be termed an internal or mucous Scarlatina. The general congestive but non-inflammatory state of the mucous membranes, the epithelial desquamation from the mucous surface, the increased temperature of the animal in the early stage of the disease, and the incubation period and critical days, are facts which all tend to support this view; while the condition of the kidneys, and the invariable presence of albumen and blood cells in the urine lend additional confirmation to it.

Condition of the Skin.—In the proportion of one-third nearly of the cases which I treated, an eruption appeared, very generally diffused over the skin, but most abundantly on the flanks. The eruption, as seen on the udder, had a vesicular character; and the date of its appearance was probably between the fifth and seventh day of the disease. This still further supports the view of its exanthematous nature.

Comparative Pathological Appearances.—I instituted a series of comparative dissections with the object of ascertaining how far the pathological lesions existing in Cattle Plague were peculiar and distinctive. Animals affected with pleuro-pneumonia and murrain (mouth and foot rot), the two other most prevalent and destructive forms of disease in cattle, were selected for this purpose, and the following conclusions have been arrived at.

Firstly, The pathological appearances found existing in uncomplicated pleuro-pneumonia bear no resemblance to those either of cattle plague or of murrain disease.

Secondly, In murrain, or mouth and foot rot disease, a portion of the lining membrane of the fourth stomach presents, in some degree, the reddened aspect found in the same stomach of animals affected with cattle plague, but there exist the following very marked distinctions: 1. In murrain, the congestive reddening is limited to the upper third of the membrane. 2. The colour of the membrane in murrain, as compared with that of cattle plague, is deficient in depth, and never exhibits the purple or mulberry tinge. 3. The epithelium is entire, and the mucous membrane otherwise sound. 4. In all the cases of murrain examined, the reddened colour of the mem-

brane was found associated with dark-coloured spots, varying in size and configuration These dark patches are sub-mucous hæmorrhages or apoplexies. The blood thus deposited acts as a foreign body, and ultimately induces erosion of the superjacent membrane.

From these conclusions it will appear that the morbid lesions existing in the chief epizootic diseases of cattle possess features which are broadly distinguishable.

Complication.—We have already observed that pleuro-pneumonia is the most dangerous and frequent form of complication of cattle plague. But the numerical proportion, as will be seen by reference to the analytical tables, of this fatal form of complication has become smaller with the increased number of dissections.

I would here beg permission to add that it would be difficult to over-estimate the loss which the country annually incurs by the constant prevalence of so destructive a disease among cattle as pleuro-pneumonia, not less pernicious as in itself a direct cause of mortality, than as the occasion of imparting a dangerous predisposition to many other forms of fatal disease. I hope soon, in a subsequent report in compliance with my instructions, to be able to direct special consideration to some facts connected with this important malady.

Experiments with Sheep.

About six weeks ago, two of the sheep which had been kept three weeks in the Sanatorium were handed over to me by Mr Swan for further experiment. They were placed in a stall where two cows had just died of the most malignant form of the disease, and they were allowed to move about the byre in which several diseased animals were under treatment. Both sheep remained well until three weeks ago, when one of them became sickly, and subsequently went through all the usual stages of cattle-pest, though in a modified form. On the eighth day of the disease it shewed the first signs of recovery, continued to improve, and is now quite well. The other sheep continued well during the whole period. The result of this experiment, and others repeated elsewhere, would seem to shew that sheep do not enjoy immunity from the disease, although they are liable to its attacks in a much less dangerous form. In the present case the attack was mild, although the animal was exposed to contagion for a lengthened period. From the results of this and other experiments we may fairly conclude that, with ordinary precaution, the disease is not likely to assume an epizootic character among sheep, although isolated cases may occur during its prevalence among the cattle.

Treatment of the Disease.

Since my previous Report I have superintended another experiment in the treatment of diseased cows, with the encouraging result of saving four of the six which were subjected to treatment, the other two having died. All the animals passed through the disease in its most characteristic form, and I attribute the recovery in the cases mentioned not less to the fact that the cows were brought under treatment at an early stage of the disease than to sedulous and persevering nursing. I feel that I cannot too emphatically impress this view upon all who would venture to

treat this formidable disease, for it is futile to anticipate any result but failure without the most earnest and strenuous endeavours properly directed.

I cannot close this report without stating that I am daily receiving, from all parts of the kingdom, incontrovertible proofs of the efficacy, when properly applied, of the mode of treatment which I ventured in a former report to recommend to the Magistrates of Edinburgh.

ANDREW SMART, M.D.

Edinburgh, 28 *Alva Street*, 11*th December* 1865.

TABULAR STATEMENT

OF THE

PATHOLOGICAL APPEARANCES FOUND IN CATTLE PLAGUE, MURRAIN, AND PLEURO-PNEUMONIA.

DR SMART'S TABLES OF COMPARATIVE DISSECTIONS OF PATHOLOGICAL

FIRST SERIES OF DISSECTIONS—EXHIBITING

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
1	Sept. 6	Cow.	Advanced.	Slaughtered.	Sanitarium.	Eruptive, or roughened condition of the lining membrane.	No apparent disease. Both stomachs loaded with food.	Gangrenous patches on several of the folds. Entire stomach impacted and distended with food.	Extreme general congestion of the lining membrane. The membrane unduly soft and fissured, and has a livid and claret colour. No ulceration.	Extreme congestion of the lining membrane, increasing towards the termination of the gut. No apparent disease of the glands. No ulceration.	Lining membrane highly congested. Smaller tubes filled with frothy sanguineous mucous.
2	... 6	Cow.	Advanced.	Died.	Sanitarium.	Eruption present.	Loaded. No apparent disease.	No diseased spots. Impacted.	Two-thirds of the lining membrane highly congested and softened, and colour reddish brown.	Extreme congestion, and softening of the lining membrane. No ulceration.	General congestive vascularity of lining membrane. No inflammatory exudation.
3	... 7	Cow.	Advanced.	Died.	Sanitarium.	Characteristic eruption present.	Loaded. No structural disease apparent.	A few gangrenous spots with scarlet margins on the gastric folds.	Characteristic condition of the entire lining membrane. Abrasions. No ulceration.	Great vascular congestion, especially of the ileum and cœcal appendage. Hemorrhoidal condition of rectum.	Reddened and highly vascular condition of lining membrane. Abundant mucus in the smaller tubes.
4	... 7	Cow.	Advanced.	Died.	Sanitarium.	Eruption on the lining membrane.	Loaded No structural disease apparent.	Gangrenous patches, with scarlet margins present on some of the gastric folds. Impaction.	Entire lining membrane congested, softened, and at some parts separated from the muscular coat. No ulceration.	General congestion of the lining membrane, increasing towards the termination of the bowel. Hemorrhoidal condition of rectum. No ulceration.	Lining membrane universally injected.
5	... 8	Cow.	Advanced.	Slaughtered.	Sanitarium.	Well-marked eruption on lining membrane of under lip. Excoriation at some parts of superficial membrane from the gums.	Loaded. No apparent disease.	Impacted. Absence of gangrenous patches.	Deeply reddened and fissured, at some places presenting an ulcerated appearance. No true ulceration present.	The lining membrane of the lower half of ileum extremely vascular and soft. No apparent disease of the glands. Lining membrane of rectum very much injected.	Reddened extremely in the larger air tubes.
6	... 9	Cow.	Advanced.	Slaughtered.	Sanitarium.	Characteristic appearance of lining membrane.	Loaded. Structure healthy.	Impacted. No gangrenous spots.	Lining membrane generally of a dark purple colour, very soft, and at some places cracked. No ulceration.	Present the usual excessive congestive vascularity. Lining membrane free of ulceration, but extremely soft and friable.	The smaller tubes are filled with frothy mucous tinged with blood and the entire lining membrane of the air passages is intensely injected.
7	... 11	Cow.	Advanced.	Slaughtered.	Sanitarium.	Eruption on superficial membrane.	No apparent disease.	Impacted. No structural disease.	General congestion, without breach of structure.	Lining membrane congested. Tuberculous condition of a few of the solitary glands. No ulceration.	Highly congested. No inflamatory exudation.
8	... 12	Cow.	Advanced.	Died.	Sanitarium.	Eruption of lining membrane.	Healthy as regards structure. Distend with food.	A few gangrenous spots on the gastric folds. The stomach distended and hard with dry and impacted food.	Characteristic appearance present. No ulceration.	No ulceration, but mucous membrane extremely congested, soft and fissured. Rectum, tumid, and of a dark purple colour.	Filled with sanguineous colour mucous. Lining membrane of all the tubes of a bright red colour.

ISIONS FOUND IN CATTLE PLAGUE, MURRAIN, AND PLEURO-PNEUMONI

HE MORBID LESIONS OF CATTLE PLAGUE.

FOUND ON DISSECTION.

Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.	REMARKS.	
mic pleuro-monia of lung.	Vulva swollen and congested. Eruptive patches on lining membrane.	Slight congestion of lining membrane.	No apparent disease.	No apparent disease. Gall bladder distended and full of bile.	Unduly soft and dark in colour.	Pyramids congested, otherwise healthy.	Not examined.	Chronic pleuro-pneumonia.	The serous membranes, with the exception of those of the right lung, were healthy.	
mic pleuro-monia of lung, with sive adhe-	Highly congested state of vulva and membrane roughened.	Vascularity of lining membranes generally increased. Otherwise healthy.	Healthy.	No apparent disease. Gall bladder filled with bile.	Normal as to size, but too soft.	Congestion of pyramids.	Not examined.	Chronic pleuro-pneumonia.	The serous membranes, with the exception of those of the diseased lung, were healthy.	
thy.	Reddened, swollen and roughened.	General increased vascularity with occasional minute ecchymosed patches.	Muscular substance relaxed. No valvular disease.	Congested, but no structural disease apparent. Gall bladder filled with bile.	Not examined.	Congestion of pyramids.	Not examined	None.	Integumentary eruption present.	
thy.	Vulva red and tumid.	Congested slightly. Lining membrane otherwise healthy.	Muscular substance relaxed. Ventricles occupied by firm clots.	Congestion of portal system. No enlargement or atrophy. Gall bladder distended with bile.	Unduly soft.	Congestion of the central portions.	Not examined	None.	Firm clots found in the heart and large vessels. The cellular tissue around the kidneys blown up with air. This animal died some hours prior to dissection.	
ro - pneumo-in a chronic of the left	Characteristic condition of vulva. Discharge from vagina.	Lining membranes congested. Minute points of ecchymoses.	Healthy.	Natural as to size. Portal system congested. Gall bladder distended with bile.	Soft and unduly pulpy.	Pyramids congested, otherwise healthy.	Membranes of brain congested. Spinal cord healthy. No effusion into either.	Chronic pleuro-pneumonia.	Blood found in a fluid state in the heart and vessels.	
be pleuro-monia at the of right lung.	Vulva very red, and the superficial membrane roughened where it joins the integument.	Increased vascularity of the lining membranes of both organs, with pin-head patches of extravasations in the bladder.	Muscular substance flabby and relaxed. Ecchymosed patch on external surface of left ventricle.	Unduly pale. Natural as to size. No apparent structural disease. Gall bladder distended wiih bile.	Natural as to size, unduly soft, colour of substance too dark.	Congestion of pyramids.	Not examined	Acute pneumonia.	Blood found in a fluid state in opening the heart and large vessels.	
olidation of entire left , with extenpleuritic adns.	Vulva red and swollen, and superficial membrane roughened.	Lining membranes of both organs congested. No extravasation.	Healthy.	No apparent disease.	Not examined.	General congestion.	Not examined.	Chronic pleuro-pneumonia.	Serous membrances, except of the diseased lung, healthy. No clots found in the heart and large vessels.	
thy, but old sions of the al membe present.	Characteristic appearances present.	Lining membranes unduly vascular, but otherwise healthy.	Healthy.	Apparently healthy	Unduly soft.	Congestion of pyramids.	Not examined.	Chronic pleurisy.	Firm clots found in the ventricles of the heart and large vessels. This animal had been dead some hours prior to dissection.	

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tub
9	Sept. 21	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on lining membrane, raw patches at the roots of the teeth from excoriation of membrane.	Loaded with food. No disease.	Distended and impacted with food. No diseased spots on the folds of the stomach.	Lining membrane uniformly of a dark mulberry colour, torn at some parts, and very lacerable generally. No ulceration or extravasation.	The whole bowel in a state of commencing gangrene and decomposition.	Lining mem generally dusky red with patel extravasate blood under
10	... 21	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on superficial membrane.	Loaded with food.	Loaded with food.	Lining membrane universally of a dark red colour. No ulceration or extravasation.	Lining membrane much abraided, extreme capillary congestion of the small intestine, and engorgement of the larger vessels of the great intestine.	Lining mem injected.
11	... 21	Cow.	Advanced.	Died.	Tyne Castle.	Distinctive appearance of lining membrane.	Loaded with food. No apparent disease.	Loaded with food. No apparent disease.	Lining membrane uniformly congested. No extravasation of blood. No ulceration.	Lining membrane extremely congested, some portions of it in the small intestine presenting a mahogany colour. No ulceration, but patches of the epithelial membrane are separated.	Uniform c tion of the membrane.
12	... 22	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on lining membrane.	No disease, but loaded with food.	No disease, but distended with food.	Two-thirds of the lining membrane present the red characteristic colour. No ulceration.	Entire lining membrane congested. The congestion most marked in the lower half of the ileum and in the rectum.	Nearly u congestion lining mem Much muco sent in t passages.
13	... 22	Quey.	Not advanced.	Died.	Tyne Castle.	No eruption on lining membrane.	No disease.	No disease.	Lining membrane reddened at some portions, but not deeply.	Increased vascularity of the lining membrane, especially towards the termination of the bowel.	Lining mem slightly red
14	... 22	Quey.	Not advanced.	Died.	Tyne Castle.	No eruption on lining membrane.	No apparent disease.	No apparent disease.	Partial congestion of the upper two-thirds of lining membrane. The remaining third being healthy.	Increased vascularity of the lining membrane generally, but not to an extreme degree.	Lining mem slightly red
15	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on lining membrane.	Healthy, but loaded with food.	Gangrenous patches on some of the folds.	Uniformly congested, of a dark, reddish brown colour. No ulceration.	Characteristic condition of lining membrane. Some patches of extravasated blood beneath the mucous membrane. No ulceration.	Lining mem much redde
16	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on superficial membrane.	No apparent disease.	No apparent disease.	Characteristic condition of lining membrane. No ulceration.	Characteristic condition of lining membrane. No ulceration, no glandular disease.	Reddened rally. No i matory dep
17	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Usual appearance on membrane.	No disease. Loaded with food.	Gangrenous patches present.	Characteristic condition of lining membrane. No ulceration.	Present the usual congestive character. No ulceration.	Mucous brane muc jected, but wise health
18	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Characteristic appearance.	Loaded, but no disease.	Healthy.	Characteristical appearance of lining membrane.	Lining membrane much congested. Superficial membrane of some portions separated in the form of casts. No ulceration.	Present the congested a ance.
19	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Usual appearance in the advanced stage.	Loaded. No disease appreciable.	Impacted with food. No disease.	Lining membranes in a state of incipient gangrene. Small erosions on the surface of it. Entire membrane nearly black in colour.	Generally gangrenous. Entire membrane at some portions separated.	Lining mem of a dark berry hue.
20	... 25	Cow.	Advanced.	Died.	Tyne Castle.	Eruption.	Loaded. No disease.	A few gangrenous spots with scarlet margins in different stages of advancement.	Lining membrane of an uniformly dark brown colour. No ulceration or ecchymoses.	Lining membrane of the inferior half of ileum of an uniform mahogany colour. Vessels of caecal appendage and large intestine, much injected. No ulceration.	Lining mem reddened, smaller filled with m expectorati

FOUND ON DISSECTION.									REMARKS.	N
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
ally emphytous.	Vulva swollen, & of a dark purple colour. Lining membrane roughened.	Partial congestion of their lining membranes. Some small points of extravasated blood beneath the mucous membrane of bladder.	Muscular substance relaxed. Ecchymosed spots on the exterior of the ventricles.	Congested generally, and gall bladder distended with bile.	Very soft and lacerable, and pulp very dark in colour.	General congestion of both organs.	Not examined.	None.	This animal had been dead some hours prior to dissection, and the tissues were already undergoing decomposition.	
nic consolin partially of lungs. Adns of the ing mem-	Vulva red and swollen.	Congestion of their lining membranes, especially of the uterus.	Healthy.	Healthy. Gall bladder filled with bile.	No very marked change.	Congestion of pyramids.	Not examined.	Chronic pleuropneumonia.	Cellular tissue of the loins, both internally and externally, was emphysematous. The heart and large vessels contained coagulated blood.	1(
thy.	The characteristic condition present.	Their lining membranes are reddened and injected, but otherwise healthy.	Healthy.	Portal system congested. Gall bladder full.	No marked alteration.	Congestion of pyramids.	Not examined.	None.	Well-marked integumentary eruption on flanks and haunches.	11
nic condenn of one lung adhesion of resting mem-	Vulva exhibits the distinctive appearances.	Lining membrane of the uterus much congested; that of the bladder slightly.	Healthy.	Congestion of the portal system. Gall bladder full.	No marked change.	Congested generally.	Not examined.	Chronic pleuropneumonia.		12
thy.	Vulva slightly reddened.	Apparently healthy.	Healthy.	Healthy.	Healthy.	Congestion of pyramids.	Not examined.	None.	This case, and No. 14 following, are examples of the disease in a modified form. Both animals were from the same place and owner; both were attacked about the same time, and both died before reaching the advanced stage of the disease.	13
thy.	Vulva slightly reddened.	Healthy.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	Retention of urine.		14
thy.	Characteristic appearance present.	Vascularity of the lining memcranes of both increased.	Healthy.	Congestion of portal system. Gall bladder distended with bile.	Unduly soft and dark in colour.	Congested.	Not examined.	None.	This is an example of an ordinary case of the disease.	15
thy.	Characteristic condition of vulva.	Congestion of their lining membranes.	Healthy.	Pale, but no structural change. Gall bladder distended with bile.	No marked change.	Congested.	Not examined.	None.	An ordinary case of the disease.	16
nic condenn of part of ung.	Distinctive appearance present.	Increased vascularity of their lining membranes.	Healthy.	No apparent disease. Gall bladder distended.	Normal as to size, but unduly soft.	Congested.	Not examined.	Chronic pleuropneumonia.	It is remarkable that the gullet is in every case quite free from disease.	17
ensation at asis of both	Characteristic.	Membrane of both slightly congested.	Healthy.	Healthy.	No marked change.	Congested. Pyramids especially.	Vessels of the cerebral membranes markedly congested.	Double chronic pleuropneumonia.		18
thy.	Vulva very dark purple colour.	Considerable congestion of the lining membranes of both.	Healthy.	Healthy.	Unusually soft.	Congested.	Not examined.	None.	This animal had been dead some hours previous to dissection; hence the gangrenous condition of some of the internal organs.	19
thy.	Usual appearance present.	The lining membrane of the uterus much injected & soft; that of the bladder slightly injected.	Healthy.	Pale in colour. No structural change. Gall bladder distended, and a few ecchymosed patches on its lining membrane.	Diminished in size, & unduly pulpy.	Congested.	Brain not examined. Cord and membranes healthy.	None.	The eruption found on the lining membrane of the mouth appears in the pharynx, but never in the œsophagus or larynx.	2(

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tub
21	Sept. 25	Stot.	Not advanced.	Died.	Tyne Castle.	Lining membrane entire.	Healthy.	Healthy.	Lining membrane partially reddened, but the colour not of a deep red.	Membrane congested slightly.	Partially ted.
22	... 26	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	No morbid appearance.	Gangrenous spots, with scarlet margins.	Lining membrane of a dusky red colour uniformly.	The usual congestive characters present.	Lining mem congested.
23	... 26	Cow.	2d Stage.	Died.	Tyne Castle.	Lining membrane but slightly affected.	Not diseased.	Not diseased, but loaded with food.	Lining membrane partially reddened. Some portions appear to be quite entire.	Usual morbid changes present, but not decidedly marked.	Exhibit th gestive con but not uni
24	... 26	Cow.	Advanced.	Died.	Tyne Castle.	Membrane entire.	No morbid change apparent.	A few gangrenous spots on the gastric folds.	Lining membrane exhibits characteristical appearance. No ulceration.	Congestive appearances present. No disease of the glands.	Lining mem much cong
25	... 26	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	Healthy, but loaded with food.	No morbid appearances.	Characteristic appearance of lining membrane. No ulceration.	Lining membrane injected; soft, and at some places detached. A few ecchymosed patches beneath mucous membrane.	Lining mem highly vas
26	... 26	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	No morbid appearance. Loaded with food.	No morbid appearance. Loaded with food.	Lining membrane exhibits the distinctive morbid appearance.	Morbid changes well marked. No ulceration or glandular disease.	Their lining branes pres usual con condition.
27	... 26	Cow.	2d Stage.	Died.	Tyne Castle.	Slight roughening of the lining membrane.	No morbid change apparent, but loaded.	A few small points of degeneration on the gastric folds.	Characteristic morbid condition present. Lining membrane torn at some places, but no ulceration.	The excessive vascularity of the lining membrane is most marked towards the end of the gut.	The usual condition lining mem
28	... 27	Cow.	Advanced.	Died.	Tyne Castle.	Lining membrane excoriated from gums.	Loaded with food.	Impacted with food. Dry and hard. No morbid change of structure apparent.	Characteristic colour, a few dark superficial spots. No ulceration.	Destructive characters present.	Lining mem congested.
29	... 27	Cow.	Advanced.	Died.	Tyne Castle.	Eruption of lining membrane.	No morbid change detected. Loaded with food.	Loaded with food. No morbid change.	Morbid conditions all present.	Lining membrane throughout very uniformly congested. A few small sub-mucous extravasations of blood towards the rectum. Lining membrane of rectum much swollen, and of a dark purple colour.	Membrane gested.
30	... 27	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	No morbid change appreciable.	Distended and hard, with impacted food.	Characteristic as to the morbid lesions present.	Distinctive morbid appearances all present. No ulceration.	Congested, cially the membrane trachea.
31	... 27	Cow.	Advanced.	Died.	Tyne Castle.	Distinctive condition of membrane.	Loaded with food.	No morbid change detected.	Lining membrane affected in the advanced form to the extent of two-thirds. The remaining third exhibits the appearance of the membrane seen in the early stage of the disease.	Tuberculous condition of some of the solitary glands. Other morbid appearances characteristic.	Injected as

FOUND ON DISSECTION.									REMARKS,	N
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
thy.	Slight redness around the vulva.	Healthy.	Healthy.	Healthy.	Healthy.	Congested slightly.	Not examined.	None.	The morbid appearances are those rather of the early, than of the advanced stage of the disease, although death resulted from it. The morbid signs in this case coincide with those found in the other calves previously dissected.	2
thy.	Reddened and swollen.	Lining membranes congested, with slight extravasations in the bladder.	Healthy.	Healthy.	No marked alteration.	Congestion of the pyramids.	Not examined	None.		22
thy.	Distinct ring of redness around the vulva.	Lining membranes are congested to some extent.	Healthy.	Healthy.	Healthy.	Congested	Not examined	None.	This animal, like many others examined, appears to have died before the disease reached its most advanced stage. This is attributable to some predisposing weakness in the animal.	23
nic condensation of right , with adhesion of investing brane.	Red and swollen at the vulva.	Lining membranes partially injected.	Healthy.	Congested gall bladder distended with bile.	Healthy.	Congested	Not examined	Chronic pleuro-pneumonia.		24
thy.	Reddened at the orifice.	Their lining membranes highly vascular; a few submucous extravasations.	Healthy. Slight extravasations on the exterior of the heart.	Portal system loaded. Liver not enlarged. Gall bladder distended with bile.	No marked morbid change.	Congested especially in the central portions.	Not examined	None.	The extravasations found amongst the morbid appearances of this case are rare and exceptional; much sub-cutaneous emphysema.	25
thy; but adhesions of investing brane.	Characteristic.	Increased vascularity of their lining membranes.	Muscular substance relaxed. Ventricles contained firm clots, resembling pitch.	Congested in the portal system especially. Gall bladder distended with bile.	No marked morbid change.	Congested	Not examined	Pleurisy.	The clots removed from the ventricles were moulded into the form of the ventricular cavities.	26
thy.	Characteristic as regards the vulva.	The usual highly vascular condition of their lining membranes.	Healthy.	Congested in some portions. No enlargement.	No marked morbid alteration.	Exhibit pyramidal congestion.	Not examined	None.	External surface of the udder is roughened by an eruption of a dry scaly character.	27
thy.	Distinctive colour present.	Some vascular congestion of their lining membranes.	Healthy.	Healthy.	No marked change.	Congested	The vessels of the membranes of the brain much injected. Spinal cord and membranes healthy	None.		28
thy.	Vulva of a dark purple colour; membrane roughened.	Vessels of lining membranes of both organs much injected. Small points of extravasated blood beneath the membranes.	Healthy.	Healthy.	No marked change.	Congested	Not examined	None.	The reddened aspect of the vulva in this case, as in most of the others, did not extend beyond two inches into the cavity of the vagina.	29
le-berry con- n of left , with dense sion of its e investing brane.	Characteristic.	Lining membranes injected.	Muscular substance flabby. Walls of ventricles thin.	No morbid change appreciable.	Normal.	Congested	Not examined	Chronic pleuro-pneumonia and weak heart.	This impacted condition of the third stomach is of frequent occurrence; in many cases, the food can be removed in cakes from between the gastric folds or many-plies.	30
thy.	Characteristic.	Congestion of their lining membranes.	Healthy.	Healthy.	Not examined.	Congested	Not examined	None.	The tuberculous condition of the solitary glands is often found existing in healthy animals, as pointed out by Professor Gamgee. This condition does not therefore constitute one of the morbid lesions of cattle-plague	31

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
32	Sept. 27	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	Loaded with food.	Loaded with food.	Impacted with food, characteristic as to all the morbid appearances.	Morbid Lesions all present. No ulceration.	Reddened. Much frothy mucus present in the tubes.
33	... 27	Cow.	Advanced.	Died.	Tyne Castle.	Characteristic appearances of membrane.	No morbid change appreciable.	No structural change detected.	Condition of lining membrane distinctive.	All the morbid lesions present.	Congested.
34	... 28	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruption on membrane.	No disease.	Impacted. No disease.	Lining membrane uniformly congested, of a dark colour, and soft.	No ulceration or glandular disease. Extreme vascular congestion of the entire intestinal mucous membrane.	Membrane much injected. Flakes of lymph on some portions of it.
35	... 28	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Lining membrane entire.	No apparent disease.	No apparent disease.	Upper third of the lining membrane presents the characteristic colour, while the remaining two-thirds of it are but slightly affected.	Lining membrane exhibits undue vascularity, especially towards the lower half of the ileum.	Partially injected.
36	... 28	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Lining membrane entire, but red line on the under gum.	Apparently healthy.	Apparently healthy.	Lining membrane exhibits a diffused but not deep redness. The membrane is otherwise healthy.	The vascularity of the lining membrane of the bowel is generally increased, but nowhere very markedly so.	Partial injection of the lining membrane.
37	... 28	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Lining membrane entire.	Contain much food, but no structural disease apparent.	Healthy.	Natural colour deepened into a rosy hue, membrane otherwise entire.	General congestion of lining membrane existing, but nowhere specially marked.	Increased vascularity of lining membrane.
38	... 28	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Membrane entire, but reddened at the roots of the lower teeth.	Not diseased.	Healthy.	Half of the lining membrane apparently healthy, the other half excessively vascular.	Lining membrane, especially of the cecal appendage and rectum, much congested.	Slight general increase of vascularity of lining membrane.
39	... 28	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Membrane entire.	Healthy.	Healthy.	Patches of the lining membrane of a bright scarlet colour. The colour of the membrane generally is increased. No other morbid condition present.	Exhibit no marked morbid change, except in the increased vascularity of the lining membrane.	Slightly reddened.
40	... 28	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	Loaded, but no disease apparent.	Hard and dry from impaction with food.	Characteristic condition of lining membrane.	Lining membrane at some portions very soft and peeling off in shreds. No ulceration or perforation of bowel.	Exhibit the usual increased vascularity of lining membrane.
41	... 28	Cow.	Advanced.	Died.	Tyne Castle.	Slight roughening of the superficial membrane.	Contain much food.	Loaded.	Portions of the lining membrane are of a deep purple colour, while other portions are but slightly altered.	There is much congestion in the lower half of the bowel, but the general morbid condition of the lining membrane of the entire intestine is less decidedly marked.	Congested in their lining membrane.
	29	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Characteristic appearance of	Not examined.	Not examined.	Characteristic condition of lining membrane.	Much congestion of lining membrane of the	Not exam

FOUND ON DISSECTION.									REMARKS.	No.
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
thy.	Characteristic.	Usual congested condition of their lining membranes.	Healthy.	Congested but natural as to size.	No marked morbid change.	Congested.	Not examined.	None.	This loaded condition of the first and second stomachs (paunch and reticulum), has been found invariably; hundredweights of pabulum are often found present on dissection.	32
thy.	Characteristic.	Characteristic.	Healthy.	No marked morbid condition.	Unduly soft and lacerable.	Congested.	Not examined	None.	In the six preceding cases, the peculiar morbid patches occasionally found on the gastric folds were not present. They are present in a proportion of the cases only.	33
from disease.	A characteristic line of redness surrounds the vulva.	Lining membranes of both unduly vascular.	Healthy.	Healthy.	Unduly soft.	Congested.	Not examined.	None.	The reddened or congested condition of the vulva, so distinctive a mark of the disease, rarely extends beyond two inches into the cavity of the vagina, the remainder of the vaginal membrane being usually healthy.	34
thy.	The vulva presents the usual colour. The redness is less decidedly pronounced than in the advanced stage.	Healthy.	Healthy.	Healthy.	Healthy.	Slight congestion of the central portions.	Not examined.	None.	This cow had been sent to be slaughtered for the market, and was probably in the second or third day of the disease when killed.	35
thy.	Vulva reddened.	Healthy.	Healthy.	Healthy.	Healthy.	Slight general congestion.	Brain, when opened, was suffused with blood, the vessels of the membrane of cord much congested.	None.	The condition of the brain and spinal cord in this case, was evidently produced by the concussion of the blow by which the animal was felled.	36
thy.	Reddened at the orifice.	Slight congestion of their lining membranes.	Healthy.	Healthy.	Healthy.	Congestion of pyramids.	Not examined.	None.	This appearance of the vagina is one of the best and earliest signs of the disease while the animal is in life. It is first seen as a faint blush on the lining membrane of the vagina, just within the orifice, at the lower part of it.	37
thy.	Reddened at the orifice, as usual.	Healthy.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	None.	The red appearance of the gums at the roots of the teeth, like that of the vagina, is one of the early signs of the disease while the animal is in life. Both signs appear at the same period of the disease, that is, in the early stage of it.	38
thy.	Crimson appearance of vulva.	Healthy.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	None.	This, and the preceding five animals, were sent to be slaughtered for the market; they were all of the same stage of the disease, that is, probably the second or third day of it, from the first appearance of the symptoms. The flesh of the animals, as in the advanced condition, did not shew the peculiar and characteristic appearance.	39
thy, but old ions of the ing membrane present.	Characteristic appearance present.	The lining membrane of the uterus but slightly affected, but that of the bladder considerably congested, and at some places ecchymosed.	Healthy.	Congestion of the portal system especially.	Soft and lacerable.	Congested.	Not examined.	Old Pleurisy.	The condition of the lining membrane of the air passages here described, is invariable in the advanced form of the disease; it is analogous to the state of the same membrane during acute catarrh.	40
mation of lungs at bases, with ions of their ing membrane.	Characteristic appearance of vulva.	Lining membranes not markedly altered.	Healthy.	Congested.	Not markedly altered.	Congested	Not examined.	Double acute pleuro-pneumonia.	In this case, as in all others, complicated to any considerable extent with pleuro-pneumonia, the morbid appearances peculiar to cattle plague are all modified; thus, *e.g.* the lining membrane of the mouth in such cases seldom exhibits the peculiar roughening or eruption so characteristic in the advanced stage of the pure disease.	41
amined.	Not seen.	Not examined.	Not seen.	Not seen.	Not seen.	Not seen.	Not examined.	Not ascertained.	This animal went to the Slaughter-Houses to be killed for the market, but condemned by the	

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
43	Sept. 29	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Morbid appearance present.	Not examined.	Not examined.	Characteristic condition of lining membrane present.	Considerable congestion and softening of the lining membrane, in the large intestine, increasing towards the rectum.	Not examined.
44	... 29	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruptive condition of the lining membrane.	Not examined.	Not examined.	Portions of the lining membrane distinctly characteristic of the disease.	Not examined.	Not examined.
45	... 29	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Characteristic condition present.	Not examined.	Not examined.	Superior half of the lining membrane decidedly diseased.	Not examined.	Not examined.
46	... 29	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruptive condition of the lining membrane present, but not markedly.	Not examined.	Not examined.	Lining membrane exhibits, though not markedly, the characteristic colour of the disease.	Not examined.	Not examined.
47	... 29	Cow.	Early stage.	Slaughtered.	Slaughter-Houses.	No eruption on the lining membrane.	Not examined.	Not examined.	Lining membrane of a diffused, uniformly red colour.	Not examined.	Not examined.
48	... 29	Cow.	Early stage.	Slaughtered.	Slaughter-Houses.	No eruption on the lining membrane.	Not examined.	Not examined.	Portions of lining membrane reddened and highly vascular, while other portions are but slightly affected.	Mucous membrane of the inferior half of ileum decidedly congested; much congestion of lining membrane of rectum.	Not examined.
49	... 29	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Portions of the lining membrane roughened slightly.	Not examined.	Not examined.	The whole of the lining membrane reddened and highly vascular. Not softened. No cracks or abrasions.	Very general determination of blood to the mucous membranes.	Not examined.
50	... 29	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	The membrane of the mouth, especially on the under gum and lip, is redder than in health, and at some parts there is the earliest indication of the eruptive condition.	Not examined.	Not examined.	Two-thirds of the lining membrane exhibit well-marked vascular determination.	Nearly uniform congestive vascularity of the lining membrane of the ilium. The membrane of the large intestine also participates, but in a less degree, in the increased vascularity.	Not examined.
51	... 29	Cow.	Early.	Slaughtered.	Slaughter-Houses.	Lining membrane reddened, but without breach of substance.	Not examined.	Not examined.	One-half of the lining membrane reddened and highly vascular, the other half less pronounced in colour, but unduly vascular.	Not examined.	Not examined.
52	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on membrane.	Healthy.	Healthy.	Characteristic appearance of lining membrane.	Lining membrane congested, and much softened, and in the large intestine presents the peculiar striped character.	Lining membrane much congested. No inflammatory products.
53	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Eruption on lining membrane. Superficicial membrane excoriating from gums.	Loaded with food, but no structural disease.	Impacted with food. Gangrenous patches on the gastric folds.	Lining membrane for the most part of a dark purple colour, soft and cracked, giving appearance of ulceration.	Some portions of the lining membrane of the small intestine have a deep mahogany colour, and there is very general vascular congestion present. The lining membrane of the rectum has the purple tumid appearance of hemorrhoids.	Lining membranes entire, but highly injected, especially in the trachea.

FOUND ON DISSECTION.									REMARKS.	No
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained.	This animal sent to the Slaughter-Houses to be killed for the market, but condemned by the inspectors.	43
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained.	This animal was sent to be killed for the market, but seized by the inspectors as diseased.	44
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained.	This animal was seized, and condemned as diseased meat.	45
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained.	This, and the preceding two cases, were condemned by the inspectors from the appearances of the mouth and stomach present, these having been shewn by me to be conclusive marks of cattle plague.	46
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained if any.	This is an example of the disease in the earlier stage of it. Observe the absence of eruption from lining membrane of mouth.	47
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained if any.	Note the coincidence of morbid appearances of mouth, fourth stomach, and intestines, all indicating the earlier stage of the disease.	48
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained if any.	Note here also the coincidence of morbid signs, all concurring and indicating a further stage of the disease.	49
examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not ascertained if any.	The flesh of this and the preceding three animals shewed no indications of the disease, and could not alone, without the morbid appearances of mouth and stomach, have been condemned as diseased. Integumentary eruption present.	50
examined.	The vulva towards the inferior angle scarlet colour.	Very slight increased vascularity of lining membranes.	Healthy.	Healthy.	Healthy.	Not examined.	Not examined.	None.	The ten preceding cases were sent to be killed for the market; five of them were in the advanced stage of the disease, and could not escape detection; of the other five, some were in the intermediate, and others in the early stage of the disease, and would have escaped detection, but for the vigilance of the experienced Inspectors.	51
thy.	Characteristic red line at vulva.	Lining membranes of both organs congested, but beneath that of the bladder there are a few ecchymosed spots.	Healthy.	Healthy.	Unduly soft.	Congested.	Vessels of the lining membranes of the brain very much engorged. Spinal cord and membranes healthy.	None.	This condition of the vessels of the lining membranes of the brain is of not unfrequent occurrence, but there are no cerebral symptoms apparent during life.	52
thy.	Orifice of a purple red colour and swollen.	The lining membranes of both organs unduly vascular.	Healthy.	Generally congested, but especially in the portal system.	Apparently healthy.	Congested.	Not examined.	None.	This hemorrhoidal condition of the lining membrane of the rectum is very generally present in animals dying of cattle plague in the last stage of the disease. The eruption on the hide has a raised and papular character.	53

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
54	Sept. 30	Cow.	Intermediate.	Died.	Tyne Castle.	Eruption on lining membrane.	No disease.	No disease.	Uniform dark red colour of lining membrane, and separation of it from muscular coat at several parts.	Peyers glands healthy. Some of solitary, glands swelled, and on pressure yielding a cheesy-looking matter. Lining membrane presents the usual appearance of the disease but not in the advanced stage.	The congestion of the air tubes extends into the larynx over the membrane of the vocal cords.
55	... 30	Cow.	Advanced.	Died.	Tyne Castle.	No eruption of lining membrane, but reddened.	Nodis ease.	No disease.	Lining membrane of two-thirds much congested, but not of a dark colour.	Very general vascular congestion of lining membrane.	The small air tubes filled with mucus tinged with blood.
56	... 30	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Lining membrane slightly roughened.	No disease apparent. Loaded with food.	Impacted with food. No gangrenous spots present.	Presents a variegated appearance as to colour, red, purple, and pink patches appearing on different parts of the membrane.	Much congestion of lining membrane of jejunum and ileum.	Lining membrane of the smaller air tubes much thickened, and exhibits much congestive vascularity.
57	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Lining membrane on the inner surface of the under lip roughened.	Distended with food.	Bullet-shaped and hard from distension of food.	Three-fourths of lining membrane altered in appearance.	Lining membrane presents no very marked characters except increased congestive vascularity.	Usual characteristic. Morbid appearance present.
58	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Lining membrane excoriated at several places.	Apparently healthy	No disease present.	Lining membrane undergoing disintegration.	Lining membrane of a dark lived colour, soft, and torn. No ulceration.	Exhibit the usual congestive appearance.
59	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Exhibits the eruptive appearance, but not markedly.	Loaded with food.	Impacted. No disease of this or 1st and 2d stomachs.	Characteristic condition of lining membrane.	The bowel is empty, its lining membrane congested, and much mucopurulent secretion present.	Congested, and tubes contain much mucus, which is of firmer consistence than usual.
60	... 30	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	The gums are unduly red, but no eruption.	Not examined.	Not examined.	Characteristic colour and condition of membrane present, but not markedly so.	Lining membrane generally, but not uniformly, congested. Portions of the large intestine appear healthy.	Not examined.
61	... 30	Cow.	Advanced.	Died.	Tyne Castle.	Lining membrane very much broken.	No structural disease detected.	Bullet-shaped, hard and firm on section; the folds are found impacted with layers of food, in a dry state.	Lining membrane in all respects characteristic.	The congestion of the lining membrane in this case was most marked in the large intestine.	Usual catarrhal condition present.
62	... 30	Cow.	Early.	Died.	Tyne Castle.	Membrane entire.	No apparent disease.	No apparent disease.	Membrane of a uniform rosy colour. Epithelium entire. No abrasions.	Increased vascularity of membranes, but otherwise no marked change.	Membrane slightly reddened. No other change.
63	Oct. 2.	Cow.	Advanced.	Died.	Tyne Castle.	Much diseased.	No disease.	No disease.	Membrane undergoing disintegration of a very dark purple colour, and torn in many places.	The whole intestine of a leaden colour, and rotten extremely. Hemorrhoidal condition of rectum.	Membrane of a dark venus congestive colour.
64	Oct. 2.	Cow.	Advanced.	Died.	Tyne Castle.	Much diseased.	Not diseased, but loaded.	Not diseased.	Lining membrane gangrenous: nearly black in colour. No ulceration.	Undergoing decomposition. Rotten.	Lining membrane very dark in colour.
65	... 2	Cow.	Advanced.	Died.	Tyne Castle.	Membrane diseased, but not markedly.	Healthy.	Loaded; Gangrenous patches in various stages of advancement found on gastric folds.	Characteristic condition of lining membrane.	Usual morbid appearances present.	Congested.

FOUND ON DISSECTION.									REMARKS.	No.
ungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
hy.	Of a dark purple colour at the vulva. This colour does not extend beyond two inches into the vagina.	Lining membranes affected in the usual manner, but in a less degree.	Healthy. But on the exterior of the ventricles there are ecchymosed patches the size of a florin.	On the under surface a few calcareous nodules, the liver is generally congested.	No marked alteration.	Congested generally, but especially in the pyramids.	Not examined.	None.	These ecchymosed patches found in this case on the exterior of the heart, are of rare occurrence.	54
hy.	Reddening of the vulva.	Slightly congested.	Healthy.	Healthy.	No marked change.	Congested.	Not examined.	Not any.		55
ic condenof one lung, dhesions of ing memof the same	The membrane of the vulva of a dark red colour.	Lining membranes entire.	Muscular substance of a pale colour, walls of ventricles thin.	Congested generally.	Congested and enlarged.	Congested.	Not examined.	Chronic pleuropneumonia.	This case, like all others complicated with pleuro-pneumonia, does not present the characteristic appearance of the disease in the most advanced form.	56
hirds of one condensed njoined hronic s.	Presents the characteristic colour.	No very marked morbid change present.	Muscular substance relaxed.	Congested.	Congested.	Congested.	Not examined.	Chronic pleuropneumonia, and impyema.	The lining membrane of the urethræ, like that of the upper two-thirds of the vagina, rarely exhibits any morbid change.	57
hy.	A ring of purple surrounds the orifice.	Uterus gravid, membrane of bladder slightly affected.	Healthy.	Somewhat enlarged and dark in colour.	No marked change.	Congested.	Not examined.	Not any.	This animal had been dead a few hours only before dissection; notwithstanding this brief interval, decomposition was already considerably advanced. The fœtus in utero was also undergoing decomposition.	58
hy, but ic adhesions s investing ranes are it at some	Lining membrane congested.	Increased vascularity of their lining membranes.	Healthy.	No marked changed.	Normal.	Congested.	Not examined.	Pleurisy.	The empty condition of the bowel here noted is very characteristic, as that also of the presence of mucus in excess. The mucus resembles pus, and has a peculiar fœtid odour.	59
xamined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not known if any.	This animal sent to the Slaughter-Houses to be killed for market, but condemned from the appearance of the fourth stomach and mouth as diseased.	60
hy.	Characteristic as to colour.	Congestion of their lining membranes.	Healthy, but ventricles filled with fluid blood of a tarry appearance.	Congested.	Unduly soft.	Congested.	Membranes of brain and spinal cord much congested. No effusion.	Fardle-bound.	This animal, during life, manifested decided head symptoms. These are attributable to the impacted condition of the third stomach.	61
hy.	Reddening of vulva.	No marked change.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	Not any.	It has not yet been noted in the preceding dissections that the gullet, as well as the first and second stomachs, is in all cases healthy.	62
lectic con- of both .	Dark purple streaks around the orifice.	Lining membranes of both organs very dark in colour, and submucous hemorrhages present.	Healthy, but ventricles and large vessels contain clots.	Congested.	Congested.	Much congested in the pyramids.	Not examined.	Pulmonary apoplexy.	This cow had been dead some hours prior to dissection, hence the putrefactive state of internal organs.	63
mortem de- sition.	Very dark colour of lining membrane.	Much congestion of lining membrane.	Adhesion of the pericardium to heart at some places; much effusion into pericardium.	Congested.	Congested.	Congestion of pyramids very marked.	Not examined.	Chronic pericarditis, with effusion.	This case, like the preceding, had undergone much *post-mortem* decomposition, although death had only occurred a few hours prior to dissection.	64
lidation of ns of both , with effu- nto thorax.	Distinctive appearance present.	Lining membrane congested.	Enlargement of heart, and adhesion to it of pericardium.	Much congested, and somewhat enlarged.	Enlarged, soft, and vascular engorgement.	Much congested.	Not examined.	Double chronic pleuro pneumonia, with hydrothorax and chronic pericarditis.	A raised patchy eruption, well marked on the teats and udder. A few of the patches contain fluid, but the majority are dry and scaly.	65

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs,	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
66	Oct. 2	Ox.	Early.	Slaughtered.	Slaughter-Houses.	Membrane entire, but reddened.	No apparent disease.	No apparent disease.	Decidedly reddened—the colour due to congestive vascularity of the lining membrane. The membrane not soft or otherwise morbid.	Lining membrane presents an almost uniform increased vascularity; no other special characters present.	Present no spe morbid app ance.
67	... 2	Ox.	Intermediate.	Slaughtered.	Slaughter-Houses.	Eruptive condition of lining membrane.	Healthy.	Healthy.	Lining membrane of a well-marked red colour, the colour of some portions being deeper. No other morbid appearance.	Very uniform congestion of lining membrane.	Congestion of ing membran in early cas
68	... 2	Stot.	More advanced.	Slaughtered.	Slaughter-Houses.	Slight eruption on mucous membrane.	Healthy.	No disease, but much impacted.	The lining membrane presents the characteristic appearance in three-fourths of it. No fissures.	All the distinctive appearances of the disease present.	Lining memb congested rally.
69	... 2	Cow.	Advanced.	Died.	Tyne Castle.	Well marked eruptive condition of membrane.	No apparent disease, but loaded with food.	Quite distended with food. No detectable disease on the leaves of the stomach.	Lining membrane of a dark mulberry hue. No ulceration, but numerous abrasions.	The duodenum and jejunum not much affected, but the ileum considerably so, increasingly towards the termination, where there is sloughing of the superficial membrane.	Present the u highly vas character. N flammatory dation.
70	... 3	Stot.	Early.	Slaughtered.	Slaughter-Houses.	Lining membrane entire.	No apparent disease.	No apparent disease.	Lining membrane presents the characteristic colour and condition of the disease in the early stage.	Large intestine but slightly affected. Small intestine presents, in a modified degree, the characteristic increased congestive vascularity.	Not examine
71	... 3	Stot.	Early.	Slaughtered.	Slaughter-Houses.	Lining membrane entire, but reddened in appearance.	Not examined.	Not examined.	Three-fourths of lining membrane of a ripe cherry colour.	Not examined.	Not examine
72	... 3	Stot.	Early.	Slaughtered.	Slaughter-Houses.	Lining membrane entire.	Not examined.	Not examined.	Upper third only of the lining membrane presents the increased coloration.	Lining membrane at various parts has a florid appearance, due to sanguineous determination.	Not examine
73	... 4	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruptive condition of membrane characteristically present.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.
74	... 4	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruptive condition of lining membrane.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.
75	... 4	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Eruptive condition of lining membrane.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.
76	... 4	Cow.	Advanced.	Died.	Sanitarium.	Diseased.	Loaded, but not diseased.	Impacted; numerous gangrenous patches with scarlet margins present.	Uniformly characteristic condition of lining membrane.	All the usual morbid characters present. Portions of the superficial membrane of the bowel separated and loose in the form of casts.	Mucous mem very general gested.

FOUND ON DISSECTION.									REMARKS.	No.
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
hy.	A blush of redness surrounds the orifice.	No appreciable change.	Healthy.	Healthy.	Healthy.	Appreciable congestion of central portions.	Not examined.	Not any.	This animal was one of an herd of oxen attacked with the disease.	66
hy.	Reddened at the vulva.	No very marked change present.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	Not any.	This ox belonged to the same herd as the preceding, but was further advanced in the disease.	67
hy.	Membrane of vulva swollen and red, and at some parts presents an eruptive appearance.	Lining membrane congested.	Healthy.	Congested.	Congested.	Pyramids much congested.	Not examined.	Not any.	This was from the same herd as the two preceding animals, but further advanced in the disease. They were all sent to be slaughtered for the market, but condemned on the morbid appearance presented by the fourth stomach.	68
hy.	Of a dark venous congested appearance at the vulva.	Lining membranes of both highly vascular, and there are submucous extravasations of blood.	Relaxed and pale.	Congested.	Soft and lacerable, very dark in colour.	Congested in the central portions.	Not examined.	Not any.	The sloughing of the superficial membrane is not of unfrequent occurrence; it is, correctly speaking, a separation or desquamation of the epithelial layer, and is charateristic of the disease.	69
amined.	Not examined.	Not examined.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	Not known if any.	This animal was sent to be slaughtered for the market, but rejected as diseased on the appearance presented by the lining membrane of the stomach.	70
amined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Not any.	This animal also, and the following, intended for the market, but condemned on similar grounds.	71
amined.	Not examined.	Not examined.	Not examined.	Not examined.	Not examined.	Congested slightly.	Not examined.	Not known, if any.	The flesh of the preceding three animals presented a perfectly sound appearance, as it always does in the early stage of the disease. It is an important question to determine, how far the beef of animals, slaughtered at this stage of the disease, is not wholesome and fit for human food.	72
en.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not known, if any.	The carcase of this cow, without the entrails, was sent to the Slaughter-Houses as marketable meat, but seized as rinderpest.	73
en.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not known, if any.	This, as well as the preceding and following carcases, were seized and condemned as unwholesome and unmarketable. The inspectors were entirely guided in their decisions by the appearance of the flesh of the animals.	74
en.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not seen.	Not known, if any.	It is supposed that the entrails of the preceding three animals were withheld, to avoid detection of the disease, but the appearance of the flesh and fat in the advanced stage of disease is so characteristic, as I first pointed out, that the inspectors were unhesitating in condemning the carcases as diseased meat. For description of appearances of flesh and fat, see plates.	75
condensa-portions of ings, and esions of g mem-	Membrane of the vulva of a red colour, streaked with purple, and roughened at some places.	Lining membranes present the usual amount of vascular congestion.	Healthy, but ventricles and large vessels contain clots.	Somewhat enlarged, and generally congested.	Normal.	Congested.	Not examined.	Double chronic pleuro-pneumonia.	The casts of the bowel here referred to, are rarely found in the form of a complete tube. But, in one instance, several continuous yards of tubular cast from the small intestine was passed during life and preserved.	76

No.	Date.	Sex.	Stage of Disease.	Slaughtered or died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
77	... 4	Cow.	Advanced.	Died.	Sanitarium.	Markedly diseased.	Not diseased.	Distended with food, numerous diseased patches on the leaves of the stomach.	Lining membrane of a dark mulberry colour, undergoing disintegration at some places. No ulceration.	Not examined.	Thickening, and much congestion of mucous membrane. Much sanguineous mucus in the tubes.
78	... 4	Cow.	Advanced.	Died.	Sanitarium.	Characteristically diseased.	No appreciable disease.	Bullet-shaped impacted, and hard food between leaves almost dry, and can be removed in cakes with the superficial membrane adhering to its surface.	Characteristic of the advanced form of the disease.	No special morbid characters present.	Not examined.
79	... 4	Cow.	Advanced.	Died.	Sanitarium.	Morbid condition present.	Not diseased.	Not diseased.	Quite characteristic.	Not examined.	Lining membrane of a dusky red, with patches of lymph on its surface.
80	... 5	Cow.	Advanced.	Died.	Sanitarium.	Eruption present on membrane.	No disease.	No disease.	Characteristic condition of membranes.	Present no special characters.	Membrane congested.
81	... 6	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	No eruption on membrane.	Healthy.	Healthy.	Lining membrane reddened, but not deeply.	Vascular determination to the lining membrane, especially in the inferior half of the small intestine.	Not examined.
82	... 6	Cow.	Advanced.	Died.	Sanitarium.	Eruptive condition of membrane.	Not diseased.	Not diseased.	Lining membrane presents typical characters of the disease.	Likewise typical as regards morbid lesions.	Not examined.
83	... 6	Cow.	Advanced.	Died.	Sanitarium.	Eruption present.	Not diseased.	Not diseased.	Distinctive morbid condition of membrane.	Characteristic.	Not examined.
84	... 12	Cow.	Advanced.	Died.	Sanitarium.	Eruption.	Healthy, but loaded.	Not diseased.	Typical morbid condition of membrane.	Nothing special to remark.	Exhibit the usual amount of congestion in the lining membranes.
85	... 13	Cow.	Advanced.	Died.	Sanitarium.	Eruption.	Not examined.	Diseased patches on the leaves.	Distinctive morbid appearance.	All the usual congestive characters of the lining membrane present, No ulceration.	Congestion of membrane.

FOUND ON DISSECTION.									REMARKS.	N
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
onic condensation at the base ne lung.	Not examined.	Not examined.	Enlarged and dilated. Walls of ventricles unduly thin.	Congested.	Somewhat enlarged, soft, readily breaking down under pressure.	Congestion of pyramids marked.	Not examined.	Chronic pleuro-pneumonia.	The remarkable spots found on the leaves of the third stomach, are present in only a proportion of the cases, and have to be sought for by carefully examining each fold; they begin in a single papilla, and are found of different sizes and forms.	7
examined.	Vot examined.	Their lining membranes are reddened and ecchymosed	Healthy.	No marked morbid change present.	Normal.	Congested.	Not examined.	General emphysema.	The separation of the superficial membrane from the leaves of the third stomach, is no mark of the disease, it is the epithelial layer which separates, and this condition occurs in the healthy stomach.	7
lthy.	Much reddened, and dark discoloration. Much discharge present in the vagina.	Congestion of lining membranes of both.	Healthy.	Healthy.	No marked change.	Congested.	Not examined.	None.	The vaginal discharge is characteristic during life, and often becomes profuse shortly before death, resembling somewhat a leucorrhœal discharge.	7
lthy.	Characteristic appearance present.	Internal membranes congested.	Healthy.	Healthy.	Healthy.	Pyramids congested. Cellular tissue of the loins is emphysematous.	Not examined.	General emphysema of cellular tissue.	This emphysematous condition, in many cases, comes on during life; in such cases the hide of the animal is puffed up, and crepitates under pressure, and when struck emits a drummy sound.	8
lthy.	Slightly reddened. No eruption on membrane.	Not markedly altered.	Healthy.	Healthy.	Healthy.	Congested.	Not examined.	None.	Note here again the absence of eruption from lining membranes of mouth and vagina. This eruption appears on both parts about the same time, and is a mark rather of the advanced, than of the early, stage of the disease.	8
lthy.	Characteristic appearance of membrane.	Not examined.	Healthy, but ventricles contained perfect casts of firmly coagulated blood.	Congested, but normal in size.	Normal.	Congested.	Not examined.	None.	This cast of the ventricles extended into the roots of the large vessels, and contained on its surface the impression of the valves.	8
onic consolidation of parts of lungs.	Not examined.	Not examined.	Healthy.	Congested.	Congested and enlarged.	Congested.	Not examined.	Double pleuro-pneumonia.	Elevated circular dry patches on the skin generally diffused.	8
lthy.	Membrane of a dark purple streaked colour.	Not examined.	Healthy.	Congested.	Normal.	Congested.	The vessels of the membranes of the brain congested; no congestion of cord.	None.	The colour of the vagina darkens, and assumes a venous purple after death. In life, it presents an acute inflammatory appearance.	8
lesions of inting membranes.	Characteristic appearance of membrane.	Internal membranes highly vascular.	Healthy.	Healthy.	Normal.	Congested.	Not examined.	Pleurisy.		8

SECOND SERIES OF DISSECTIONS instituted for the purpose of ascertaining the

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Intestines.	Air Tubes.
86	Oct. 4	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Ulcers of various sizes on the tongue and palate.	Healthy. Not loaded.	Healthy.	The upper portion of the lining membrane is somewhat reddened in colour, and dark-coloured irregularly-shaped patches appear on it.	Healthy.	Healthy.
87	... 4	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Tongue swollen, and deep erosions of the membrane on the dorsun and sides of it.	Healthy.	Healthy.	Portions of the lining membrane have a brownish-red colour; the other portions of the membrane are quite healthy, and dark spots, with depressed surface, are found at the superior portion of the membrane.	Healthy.	Healthy.
88	... 4	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	On the tongue and different parts of the buccal cavity there are breaches of their substance, some penetrating deeply, and forming true ulcerations.	Healthy.	Healthy.	Over the lining membrane of the upper third, there is an undue redness. The rest of the membrane is quite healthy, but there are present spots on it of irregular form, and dark-brownish black colour.	Healthy.	Healthy.
89	... 4	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Patchy discolorations, without breach of substance, at different parts of the buccal cavity.	Healthy.	Healthy.	The upper half of the lining membrane is reddened in colour, but otherwise healthy. No ulcerations, but dark spots or patches are present on the superior portion of the membrane.	Lining membrane at some portions indicate increased vascularity, but the membrane of the intestine, with this exception, is healthy.	Healthy.
90	... 4	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	Very large patches of ulceration on different parts of the tongue. Some of these have depressed centres, with considerable breach of substance. These sores are also present on other parts of the mouth.	Not diseased.	Not diseased.	The reddened colour of portions of the lining membrane is deeper than in some of the other cases examined. But the dark spots present are the same as to size, colour, and form, but more numerous.	No apparent disease.	Not congested, nor any other morbid appearance present.
91	... 4	Cow.	Early.	Slaughtered.	Slaughter-Houses.	On the roof of mouth and back part of the tongue there are patches of discoloured membrane, without breach of substance, but no eruption on lining membrane of mouth.	Healthy.	Healthy.	The upper fourth of the lining membrane is reddened, and associated with black spots.	Healthy.	Some slight congestion of the lining membrane.
92	... 5	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	A single ulcer, the size of a florin, seated on the posterior dorsun of the tongue; two others, smaller, on the roof of the mouth.	No apparent disease.	No apparent disease.	Distinctive appearances as to colour and spots present.	No apparent disease.	Healthy.

DISTINCTIVE PATHOLOGICAL LESIONS existing in MURRAIN DISEASE.

FOUND ON DISSECTION.									REMARKS.	N
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.		
lthy.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Deep ulcerations on the feet between the hoofs.	The ulcerations here noted, as found in the mouth, are true ulcerations, which penetrate deeply.	8
lisease.	No disease.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Deep ulcerations between the hoofs of fore feet.	The ulcerations of the mouth are generally circular in form, having depressed centres, with raised edges.	8
e consolidat at the base of lung. Other- healthy.	No red appearance at the vulva.	Lining membranes quite healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Ulcerations between hoofs, penetrating deeply.	The lining membrane of the mouth is quite healthy and free from eruption, the ulcers here noted must not therefore be confounded with the eruption on the lining membrane, so distinctive of cattle plague.	8
e old-stand emphysema.	Normal as to appearance.	Uterus graved. Bladder healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Between the hoofs of the fore feet there are ulcerous excavations, and to a less extent in the hinder feet.	The ulcers in this disease are generally of a circular form, and vary as to size and depth of penetration, that is, as to stage of advancement.	8
lthy.	Normal.	No apparent disease.	Muscular substance somewhat relaxed.	Healthy.	Normal.	Healthy.	Not examined	Very deeply penetrating cavities between the hoofs of all the feet.	The eruption found on the lining membrane of the mouth, in the advanced stage of cattle plague, is simply an accumulation of the epithelium, and is thus contradistinguished from the true ulceration of murrain.	9
adhesions of investing brane at e places, and e slight ociation of s.	Normal.	Normal.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Excavating ulcers of feet, and slight chronic pleuro-pneumonia.	These patches of discolouration on the membrane of the stomach, appear to result from extravasations of blood under the mucous membrane. I have not found them except in this disease, and consider them distinctive. The blood, acting as a foreign body, induces erosion of the superjacent membrane, and this explains why, in some cases, it is depressed, fissured, and deficient.	9
lthy.	Normal as to appearance and condition.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined	There are sores of an ulcerous character between and around the hoofs.	The red colour of the lining membrane of the fourth stomach is not, as in cattle plague, associated with other morbid conditions, such as softening and degeneration, &c.	9

No.	Date.	Sex.	Stage of Disease.	Slaughtered or Died.	Where Dissected.	PATHOLOGICAL APPEARANCES.					
						Mouth.	1st and 2d Stomachs.	Third Stomach.	Fourth Stomach.	Testines.	Air Tubes.
93	Oct. 5	Cow.	Intermediate.	Slaughtered.	Slaughter-Houses.	Several small ulcerated patches in different portions of the buccal cavity.	Healthy.	Healthy.	One-third of lining membrane of a light cherry colour. Over the same portion of the membrane are present half-a-dozen dark-coloured markings of different sizes.	No morbid condition present.	Healthy.
94	... 5	Cow.	Advanced.	Slaughtered.	Slaughter-Houses.	The ulcerous condition in advanced form present.	No morbid condition present.	No morbid condition present.	The characteristic appearances already described present.	Healthy.	Healthy.
95	... 5	Cow.	Intermediate.	Died.	Slaughter-Houses.	Quite distinctive of the disease.	Healthy.	Healthy.	The reddened appearance of lining membrane is comparatively slight, and limited to a hand-breadth; and only one or two of the distinctive spots present, and these small.	Healthy.	Healthy.

Note.—Several other dissections of animals with this disease were made,

THIRD SERIES OF DISSECTIONS instituted for the purpose of ascertaining the

96	... 6	Cow.	Chronic.	Slaughtered.	Slaughter-Houses.	No morbid appearance.	Healthy.	Healthy.	Healthy.	Healthy.	Lining membranes congested and thickened, and much thick mucus present.
97	... 2	Cow.	Chronic.	Slaughtered.	Slaughter-Houses.	No morbid appearance.	Healthy.	Healthy.	Healthy.	Healthy.	Lining membrane somewhat congested.
98	... 6	Cow.	Advanced.	Died.	Sanitarium.	No morbid appearance.	No structural disease, but loaded and distended.	Impacted with food, & hard.	Healthy.	Healthy.	Membrane thickened and congested. Much thick expectoration on the membrane.

Note.—Several other dissections of animals with this

I deem it right, in conclusion, to mention that the suggestion to have comparative dissections upon an extended scale the post-mortem examinations recorded in the preceding Tables, and evinced the deepest interest in the progress of the

28 Alva Street, 11*th December* 1865.

FOUND ON DISSECTION.									REMARKS.
Lungs.	Vagina.	Uterus and Bladder.	Heart.	Liver.	Spleen.	Kidneys.	Brain and Spinal Cord.	Complication.	
Some old adhesions of the investing membranes present.	Normal.	Healthy.	Healthy.	Healthy.	Healthy.	No apparent disease.	Not examined.	Foot-rot and chronic pleurisy.	The stomachs of the animal in this disease, were not found loaded or impacted, as in cattle plague.
Healthy.	Healthy.	No apparent disease in either organ.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Foot-rot.*	The flesh of animals in the last stage of murrain, did not present the appearance peculiar and distinctive of rinderpest.
Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Healthy.	Not examined.	Foot-rot.	

and similar morbid appearances were in all cases found existing.

DISTINCTIVE PATHOLOGICAL LESIONS existing in PLEURO-PNEUMONIA.

Right lung carnified. Adherent pleurse and chronic abscess.	Healthy.	Healthy.	Dilated and relaxed.	Congested	Congested somewhat.	No apparent disease.	Not examined.	Chronic abscess of lung.	Observe the absence in this case of the distinctive appearances of both cattle plague and murrain.
Consolidation of both lungs at bases Extensive adhesions of investing membrane.	Healthy.	Healthy.	Enlarged. Pericardium adherent.	Congested	Congested somewhat.	Generally congested.	Not examined.	Chronic pericarditis.	An ordinary case of the disease.
The whole of one lung and part of the other consolidated, and investing membranes very generally adherent. Effusion into sac of one lung.	Healthy.	Healthy.	Dilatation of ventricles; the walls of which are thin and relaxed.	Enlarged, and general congestion.	Normal.	Congested somewhat.	Not examined.	Impaction of third stomach. Fardle-bound.	This condition of the third stomach was attended by violent head symptoms some days before the animal died. The flesh of animals dying in the last stage of chronic pleuro-pneumonia possesses a peculiar dark colour, but may readily be distinguished from rinderpest beef by the characters already mentioned.

disease were made, and similar results found.

emanated with Bailie Miller. And I think it my duty still further to state, that Bailie Alexander was present at nearly dissections.

ANDREW SMART, M.D.

Fig 1

From dissections, by Andrew Smart M D

W H M^c Farlane Lith^r Edin^r

Drawn by Neil Stewart

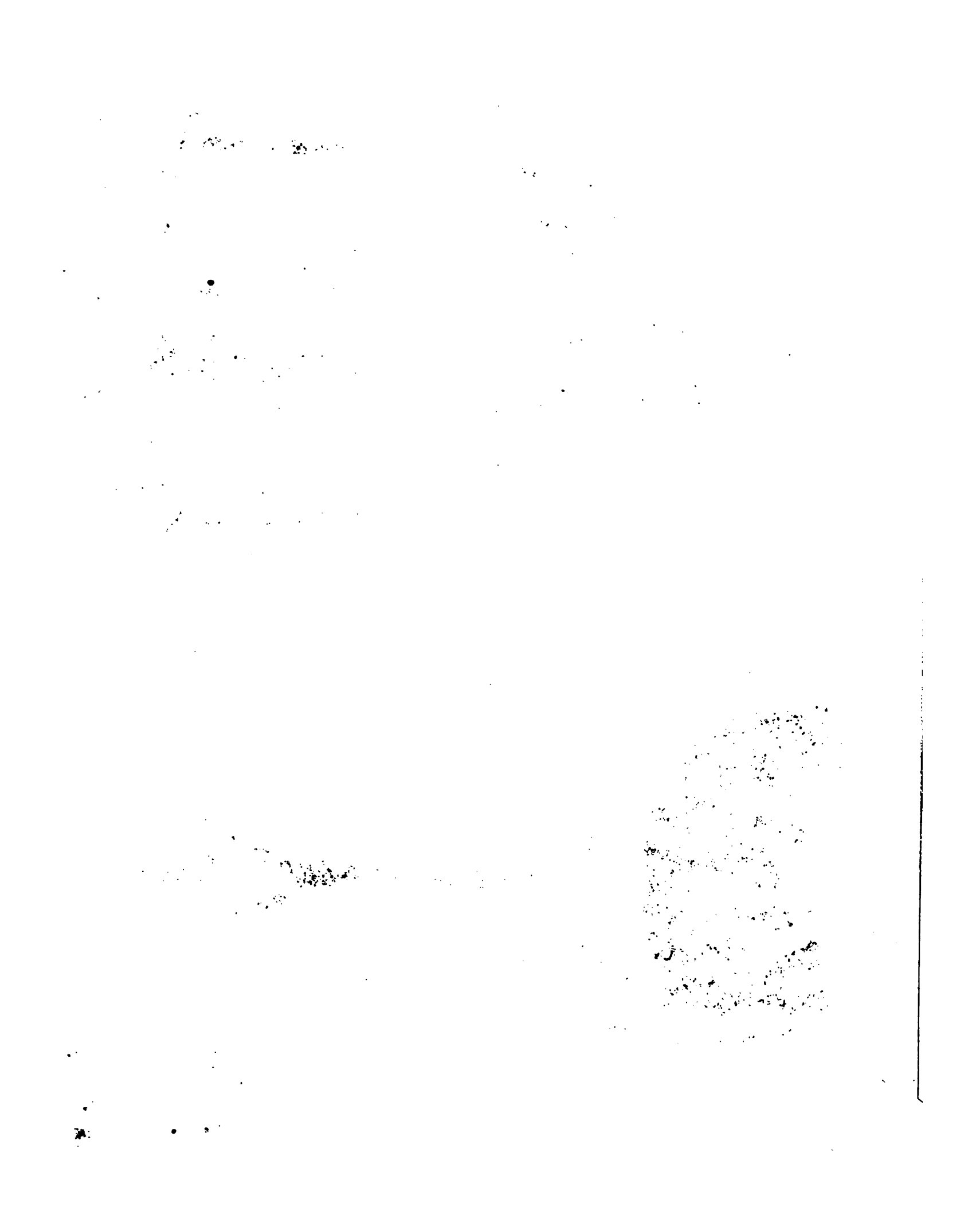


Plate II.

Fig 4

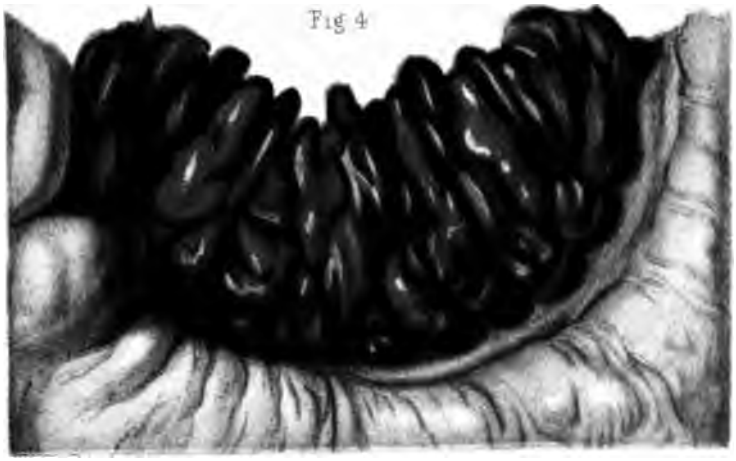
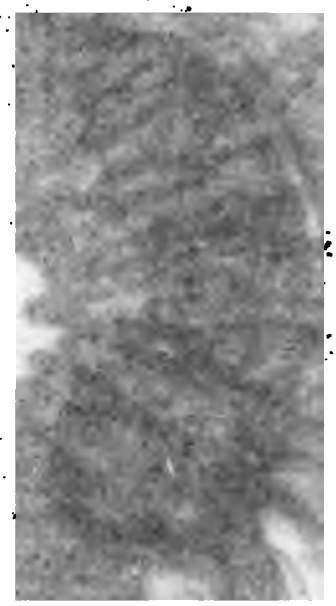


Fig 5

Fig 2

Fig 1

Fig 3



DESCRIPTION OF PLATES.

PLATE I.

Fig. 1. Piece from the gastric fold of the third stomach. Shewing the unique and remarkable pathological appearance sometimes found on that membrane. For description, see Report, p. 4.

Fig. 2. (*a*) Piece from the same membrane, exhibiting a single papilla undergoing morbid degeneration in the earliest stage. (*b*) The same seen under high magnification. Observe the extreme congestion of the papillary vessels, and their mode of extension to the neighbouring papillæ. The dark spot at the apex of the papilla indicates commencing gangrene. For full description, see Report, p. 4.

Fig. 3. Piece from fourth stomach or abomasom. Shewing very characteristically its appearance, both in the earlier and more advanced stage of degeneration. For full description, see Report, pp. 4 and 5.

Fig. 4. Piece from the same stomach, of a cow which died of murrain (or mouth and foot rot). Intended to shew the distinctive pathological appearances present in the lining membrane of the fourth stomach, in this disease. There are the following distinct characteristics:—1. In murrain, the lining membrane is reddened, but without any degeneration of its structure. 2. The dark, irregular patches seen on the membrane are never present in Rinderpest, and have been found in all my dissections of murrain cattle. They are hemorrhages or apoplexies of the mucous membrane.

PLATE II.

Fig. 1. Shewing the aborescent or capillary congestion of the small intestine. Very characteristic. See Report, p. 5.

Fig. 2. Piece of large intestine, presenting the characteristically striped appearance. This is due to the highly congested condition of the vessels of the mucous folds (rugæ) of intestine. See Report, p. 5.

Fig. 3. Windpipe. Very characteristical condition of its lining membrane. No false membrane or inflammatory exudation, but general congestive vascularity. See Report, p. 3.

Fig. 4. Shewing hemorrhoidal condition of the rectal folds of mucous membrane. See Report, p. 5.

Fig. 5. Shewing vagina. The vulva swollen and congested. Eruption on the membrane, and ropy discharge from the orifice. See Report, p. 6.

PLATE III.

Fig. 1. Small intestine, shewing a very characteristic mahogany appearance, resulting from complete capillary congestion.

Fig. 2. Lower jaw of a Rinderpest Cow. Under lip everted. Shewing characteristic

epithelial eruption or roughing of the superficial membrane of the under lip. Also the characteristic peeling off, at a more advanced stage of the disease, of the same membrane, from the gum, exposing the raw surface. See Report, p. 8.

Fig. 3. Flesh of Rinderpest Cow, newly slaughtered, with fat attached, shewing the peculiar characters of each. For description, see Report, pp. 7 and 8.

Fig. 4. Same delineated, after exposure to light and air for twenty-four hours. Indicating change of colour and shrinking, especially of the fat. For description, see Report, p. 8.

Fig. 5. Section of beef-steak from healthy Ox, after twenty-four hours' exposure to light and air. Note distinctive colours of both muscle and fat. For description, see Report, p. 8.

PLATE IV.

Fig. 1. Microscopic field greatly magnified. Shewing, 1. Scaly Epithelium of the mouth. Some are rolled up into scrolls and cylindrical forms, while others present their proper flattened and nucleated appearance. 2. A few mucous corpuscles and some vegetable cells, evidently derived from the animal's food. The materials of this microscopic demonstration were obtained by scraping the epithelial eruption from the mucous surface of the under lip of a diseased cow. The epithelial scales are very granular, and evidently undergoing retrograde degeneration. See Report, pp. 3 and 4.

Fig. 2. Microscopic appearance, under high magnification, of perfectly healthy blood from a freshly slaughtered ox. 1. The cell walls of a few of the red corpuscles are corrugated. This is due to the sudden change of temperature produced by transferring the warm blood of the dying animal to the unheated slide of the microscope. 2. Observe the proportion of the white to the red cells. 3. The absence of granular matter; and 4. The freedom with which the cells can be individualised on the field. See Report, p. 7.

Fig. 3. Microscopical appearance, under high magnification, of blood from a freshly slaughtered Rinderpest cow, shewn under precisely similar circumstances to the above. Observe, 1. That the red corpuscles, as compared with the healthy, are all much smaller. 2. That the white cells are proportionally much more numerous than in health. 3. That they are all distended and some are ruptured, shedding their contents on the field. 2. That they are all crenated, presenting, in a very striking manner, the stellar form. 3. The field is covered with granules from broken down cells. 4. From a peculiar quality of cohesion or stickiness, the blood corpuscles cling together in irregular masses. From this circumstance it is extremely difficult to isolate them for microscopical examination. This peculiarity is probably due to the same cause which induces stagnation of the blood in the vessels. See Report, p. 7.

Fig. 4. Colour of newly drawn blood from a healthy ox. See Report, p. 6.

Fig. 5. Colour of newly drawn blood from Rinderpest cow; observe its extremely dark colour. See Report, p. 6.

Fig. 6. Microscopical field of healthy milk, shewing the normal relation of the fat cells to the other constituents. See Report, p. 7.

Fig. 7. Microscopical appearance of milk from a cow in the most advanced stage of the disease. The entire field is occupied by fatty cells crowded together, and overlaying each other. See Report, p. 7.

Fig. 1

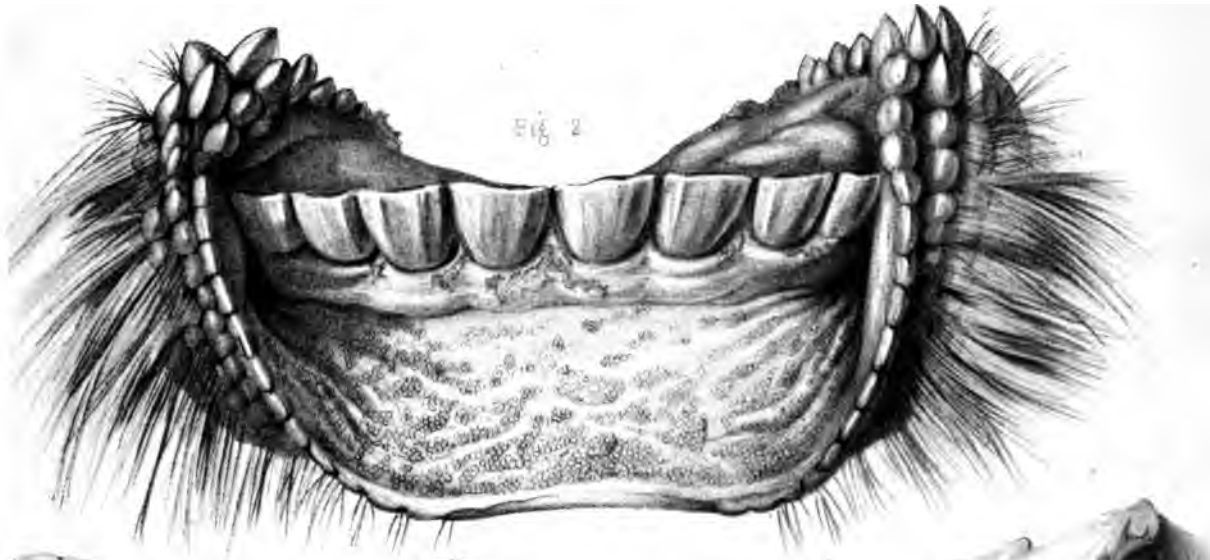


Fig. 2

Fig. 3

Fig. 4

From dissections by Andrew Smart, M.D.

M. & N. Hanhart Lith.rs Edinr.

Drawn by Nat. Shaw

Fig 1

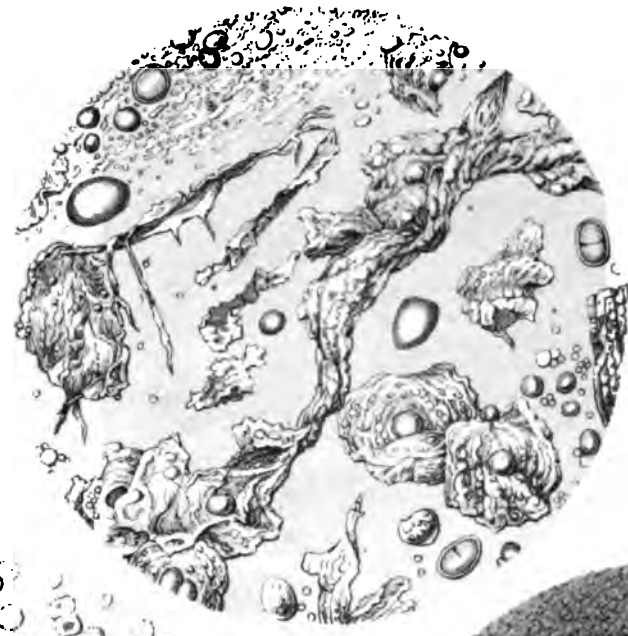


Fig 4.

Fig 5.

Fig 2

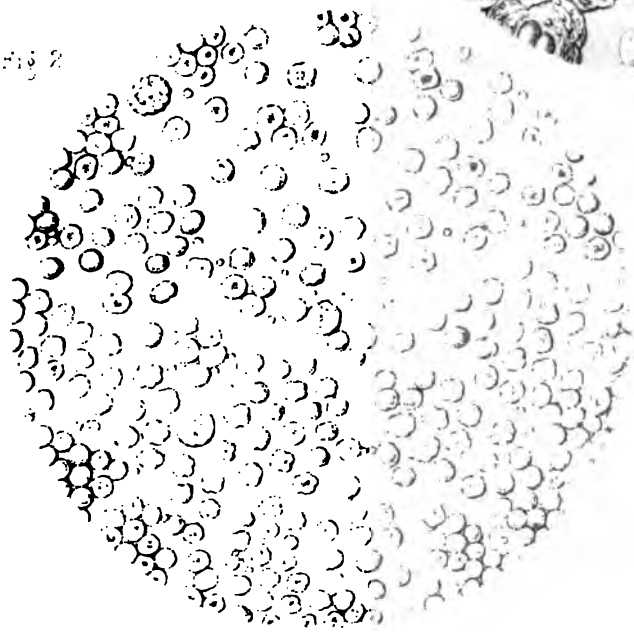


Fig 3

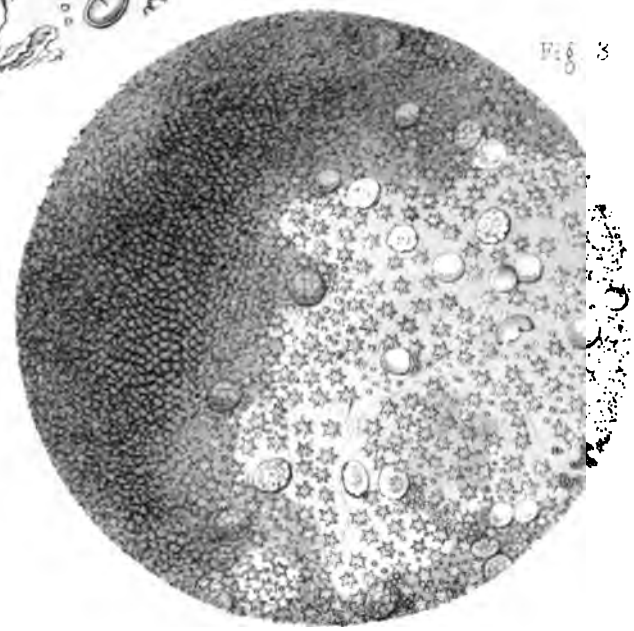


Fig 6

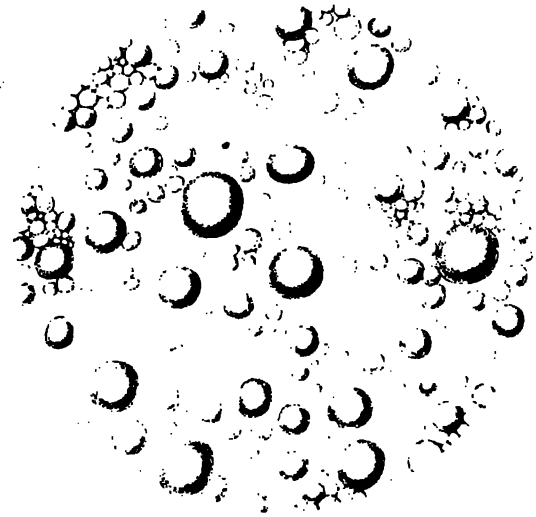
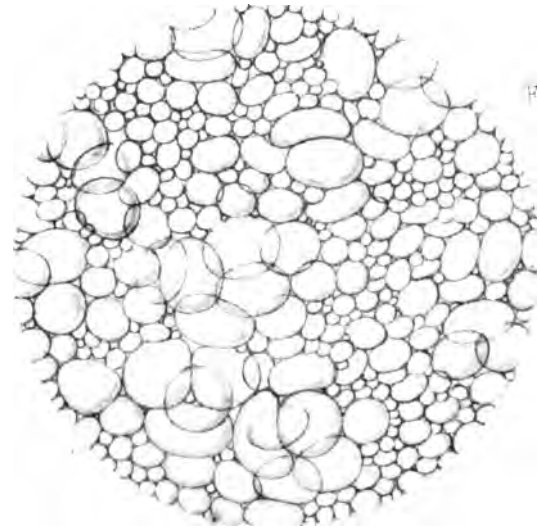


Fig 7



From preparations [illegible]

[illegible] Microscopic [illegible]

V.—INTERIM REPORT

ON THE

MEANS OF PREVENTING AND CURING RINDERPEST, by the MEDICAL COMMITTEE appointed by the Lord Provost and Magistrates of the City of Edinburgh to investigate the Disease, and consisting of the following members, viz. :—Dr ANDREW WOOD, *Chairman;* Professor DOUGLAS MACLAGAN, Dr LITTLEJOHN, Dr SMART, Professor DICK, V.S., Mr STRANGEWAYS, V.S., and Mr ROMANES, V.S.

The Committee having been engaged only for the limited period of one week in the performance of the important duties committed to them—duties which necessarily involve the long, accurate, and patient observation of the phenomena of a new disease—cannot be expected at this early period to have completed the investigation in so thorough a way as to enable them to draw up a conclusive report. Having, however, been requested by the Lord Provost and Magistrates, to prepare an Interim Report, in order to guide them as to the best means of preventing the spread of the disease, and to afford to owners of cattle practical hints as to what they should do in the present emergency, the Committee beg to submit the following remarks founded on their observation and inquiries, so far as they have yet gone. The Committee gladly acknowledge the valuable assistance which has been given them by Dr Smart, one of their number, who has already made most important contributions to our knowledge of the pathology of Rinderpest, and whose zeal, ability, and perseverance in devoting himself to a scientific and experimental investigation of the disease, is worthy of all commendation.

Having thus premised, the Committee proceed to state their views in detail as succinctly as possible.

1. The Committee, without endeavouring fruitlessly to decide the questions, how and where Rinderpest originated, and whether it has been imported or not, have to state their decided conviction that the disease is communicated by contagion from diseased to healthy cattle, and apparently by contagion alone.

2. No amount of filth will generate Rinderpest *de novo*, but it undoubtedly predisposes cattle to take the disease by weakening their resisting powers; and it tends greatly to intensify the poison and to help to propagate it. The poison of Rinderpest seems to be a specific poison, just as the poison of smallpox or of scarlet fever is a specific poison.

3. This contagion, then, consists of a subtle specific poison, inappreciable by the senses, which is developed in the living bodies of cattle affected by the disease. Whether it can be propagated by innoculation is a question which still remains to be tested.

4. The poison of Rinderpest, in common with that of other diseases, technically called zymotic, when exhaled from the lungs, or from the skin, or from the excretions

of infected cattle, being introduced, chiefly as it is believed by inhalation, into the lungs of healthy cattle, passes into the blood, where it multiplies itself. The whole mass of the blood becomes rapidly affected, and, thus changed, is carried in the course of the circulation to every tissue and organ of the body.

5. It seems not improbable that infection may be carried by the poison adhering to the clothes of those in attendance on diseased cattle.

6. Whether sheep are liable to take Rinderpest, or whether, if not liable to take the disease, they can, after being brought in contact with diseased cattle, carry the infection to healthy cattle, are problems which are now being submitted in this city to tests calculated to be decisive of these important questions.

7. Howsoever the poison may have been introduced into the system, it is certain that for some days after its introduction, whilst the changes in the blood above referred to are going on, there may be, and there are in general, no external symptoms appreciable even by a minute and experienced observer; nevertheless, there is little reason to doubt that during that period, which is technically called the period of incubation, animals thus infected are capable of imparting the disease to healthy animals with which they may be brought in communication.

8. The period of incubation seems generally to last for six or seven days, but it may extend to ten or to fourteen, or even to twenty-one days, though these longer periods are probably exceptional.

9. If these views be correct, then it is obvious that not only is the isolation of healthy from infected cattle imperatively demanded, but that there is great risk, under present circumstances, in bringing together droves of cattle, as at fairs and markets, seeing that amongst them may be included infected animals capable of communicating infection, even though they may exhibit no outward symptoms of the disease detectable by the most experienced veterinarians.

10. It would appear to the Committee to be the legitimate practical induction from these premises, that fairs and markets for the sale of lean or store cattle should be for the present suspended. The greatest caution should also be exercised in regard to the traffic in fat cattle. If markets for fat cattle could be avoided, and some other arrangements could be made by which the butchers could supply themselves, that course would be highly desirable. But if such markets be unavoidable, then it would be desirable, as suggested by Mr Swan, the eminent cattle salesman, that they should be held more frequently than at present—say twice a week instead of once a week—so that the lots of cattle purchased by the butchers might be at once slaughtered without any delay, instead of its being necessary to keep some of them for several days before being slaughtered, at some risk of spreading infection.

11. The Committee are decidedly of opinion, that cases of Rinderpest may and ought to be treated with a view to cure. They believe that the disease, especially if seen in its very earliest stages, is amenable to treatment; that even where the symptoms have lasted for some time, and have assumed a grave aspect, the case is not to be looked on as hopeless, and its treatment abandoned. They feel themselves warranted in stating their belief that, under proper tending, diet, and medical treatment, attention to all of which is essential to success, a not inconsiderable per-centage of cattle attacked by Rinderpest may be saved.

12. The tendency of an epizootic, as of a human epidemic, to become milder in its type after it has lasted for some time, is known and acknowledged by medical men. If this hold good in regard to Rinderpest, as is most likely to be the case, it may fairly be expected that the disease will become milder and more tractable, and that the proportion of deaths will be notably diminished.

13. After what they have just said, the Committee need hardly add, that they deprecate and strongly protest against the system of indiscriminate slaughter, which has been recommended, and to a large extent acted on throughout the country. This desperate course has probably caused the loss of many valuable animals, which, under appropriate treatment, might have been saved.

14. In the view of the successful treatment of Rinderpest, it is of the utmost importance that the disease should be carefully looked for, so that it may be detected in the early stage; and it is also of great importance that those who are in charge of cattle should be conversant with the earliest symptoms.

15. The Committee therefore deem it advisable here to give a brief description of the SYMPTOMS by which the disease may be recognised. They are as follows:—viz. The infected animal looks dull, its ears hang backwards; its skin feels cold; it begins to loathe its food, and soon thereafter ceases to chew the cud. The milk begins to diminish in quantity; it does not cease, however, to flow in the earliest stages; its quality is at first little altered, but soon becomes changed, and about the end of the first week, if not sooner, it is found to be scanty, thick, yellowish, and creamy. The earliest distinctive morbid appearance is seen in the vulva, which is unnaturally red, with generally a few bluish streaks, the red colour gradually deepening as the disease advances. At a considerably later stage there is superadded a raised, patchy, eruptive appearance. In all the stages, generally, though not constantly, there exudes a white stringy discharge. Simultaneously with the appearance on the vulva, the mouth also shews distinctive appearances. There is a marked bluish ring round the root of the teeth, gradually extending over the gum to the inside of the lip. These appearances on the vulva and in the mouth are seen in no other disease of cattle but Rinderpest. The pulse is always accelerated. The number of beats in health may be stated at 40 to 45 per minute in the field, and 50 to 60 in the byre. In Rinderpest the beats mount up to 80, 90, and 100. The respiration is also hurried—instead of from 18 to 20 inspirations per minute, as in health, the inspirations in Rinderpest mount up to 40, 50, 60, or even considerably higher. Besides being quick, the breathing often becomes laboured and noisy. This is more especially the case when the disease is complicated with pleura—a not unfrequent occurrence. The bowels are generally costive in the early stage, though sometimes there is "scouring" (diarrhœa). When the case is going on unfavourably, the symptoms all become aggravated, the roughness of the inside of the lip increases, the strength diminishes, and the animal dies apparently from exhaustion. When the case is going on favourably, the animal begins to look cheery, carries its ears forward, begins to take its food, and to chew the cud, the milk returns, and gradually assumes its natural appearance. The distinctive appearances on the vulva and inside the mouth disappear very slowly.

16. The Committee do not consider it necessary on the present occasion to enter minutely on the pathological conditions of Rinderpest, especially as these have been

so accurately described by Dr Smart in his report, to which they refer those who wish to study them in detail. They would only here advert shortly to several particulars, as elucidating the principles on which treatment should be based:—

A. The blood in Rinderpest is materially changed. It has a thick, black, tarry appearance. It sometimes coagulates, but oftener not.

B. Invariably in the early stage, even before the vulva and mouth have become affected, the lining membrane of the fourth stomach, and of the whole intestinal canal from that stomach downwards, shews appearances of disease. This is indicated by what is at first a mere blush of redness on the surface of the lining membrane, quite appreciable, however, when compared with the pale, fawn-coloured appearance found in the healthy state. As the disease advances, the redness, which is due to congestion of the vessels, increases, and the membrane becomes altered and softened.

C. There is generally extreme loading of the stomachs with food, and the third stomach (the manyplies) is impacted with a hard, dry mass, which swells it out into the form of a large round ball.

D. The lining membrane of the air passages also shews a congested, red appearance.

17. Rinderpest is evidently a disease of low type, and the tendency to death is by exhaustion. This being the case, it is clear that violent and lowering treatment is wholly inadmissible, and calculated to operate most injuriously.

18. The Committee would next allude to the particular indications of TREATMENT. The animal should, as soon as the disease is detected, be separated from other cattle, and placed in a comfortable outhouse, byre, loose-box, or stable, well ventilated, but not cold. If wooden sheds be used, they should be so constructed as to admit of being easily kept warm—say at a temperature of about 70 degrees. The greatest attention must, of course, be paid to cleanliness. The manure should be frequently removed and all of it submitted to the action of disinfectants, of which the best is the chloride of lime (bleaching powder).

19. It is of great importance to promote the circulation of the skin and to restore the natural heat of the surface. For this purpose the animal should be carefully and vigorously rubbed down, and then covered with a warm rug. Warm drinks of gruel, bran tea, or hay tea, should be copiously administered, and these should constitute the only food of the animal in the early stage. The animal, which is generally thirsty, may be allowed as much cold water as it wishes. Stimulant diaphoretics, and diuretics, will also be found useful as tending to promote the action of the skin and kidneys, and thus to relieve internal congestion, and to aid in eliminating the poison of the disease from the system. Dr Smart's formula is two ounces of the aqua acetatis ammonia (Mindererus' spirit), with one ounce of sweet spirits of nitre, and with this he combines as a stimulent six drachms of the carbonate of ammonia in nine ounces of water. This may be given three times in the day.

20. The loaded state of the alimentary canal, which is so constant an occurrence in Rinderpest, requires to be relieved by the use of mild laxative medicines, given very early in the disease. But strong saline and gastric purgatives must on no account be used, as their action would not only exhaust the animal's strength, but would prove most injurious to the irritation it would occasion to the mucous lining of the intestines

in its highly congested and tender state. Professor Dick prefers as a laxative linseed oil in doses of sixteen ounces, to which he adds half a mutchkin of whisky. Dr Smart recommends a laxative consisting of two ounces of sulphur, one ounce of nitre, one ounce of pounded ginger, and one pound of treacle with water to make a quart. Whichever of these laxatives be given, it must be repeated at intervals of some hours till a full effect has been produced.

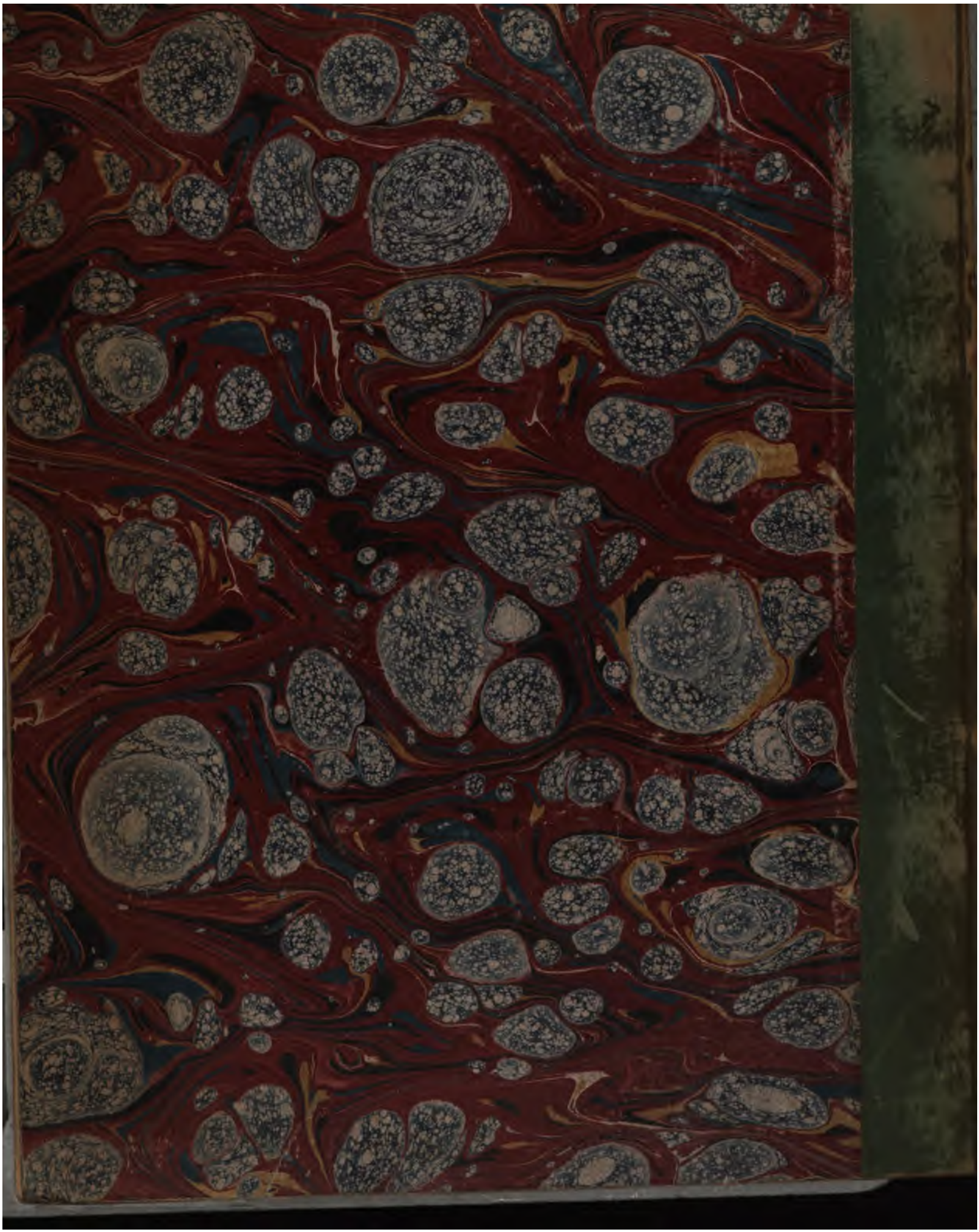
In some cases scouring (diarrhœa) proves a troublesome symptom, for the relief of which Professor Dick recommends the use of lime water in doses of a quart, to which he adds from half an ounce to an ounce of laudanum, and this he gives three times a day till the diarrhœa has been subdued.

The use of stimulants should follow upon these remedies, or, if need be, they may be given simultaneously with them. The carbonate of ammonia is that which seems to act most beneficially, and this may be given in six drachm doses three times a day. To promote convalescence tonics are prescribed. These may consist of either sulphate of iron in half-ounce doses, given twice a day as recommended by Professor Dick, or of powder of cinchona in doses of one ounce and a half, given once a day as recommended by Dr Smart.

21. Such is a sketch of what the committee consider a rational system of treatment at once safe and simple. Cases of recovery have unquestionably taken place, some of them under the eyes of members of the Committee, in animals so treated, and it seems worthy of a fair and extensive trial.

22. The Committee are anxious to receive communications as much as possible in detail as to the results of the above or any other treatment that may be tried throughout the country. The Committee entertain no prejudice for or against any particular system of treatment; they desire authentic information. They do not believe in any specific for the cure of Rinderpest. They believe that in this as in all other diseases sound pathological knowledge of the disease constitutes the only reliable basis for safe or successful treatment. They believe further that the treatment they have recommended can only prove successful if all the items be carefully and faithfully carried out in practice, whether as regards diet, regimen, tending, or medicine.

The Committee have only, in conclusion, to ask indulgence for a necessarily imperfect report, and to state that they will continue their investigations both scientifically and practically, in the hope of being able ere long to communicate to the Lord Provost and Magistrates the result of further observations and experiments which may throw ight on the steps best adapted for the prevention and cure of a terrible disease, which now constitutes nothing less than a national calamity.

Submitted in name and by appointment of the Committee by

ANDREW WOOD, M.D., *Chairman.*